Aiscom Computer Tape

IBM seeks to curb overlaps in its own divisions

STEPS have been taken by IBM to minimise the number of occasions when salesmen from the company's Data Processing and General Systems divisions arrive at the same customer site proposing alternative solutions to his problems.

Product announcements over the past two years have led to major overlaps between systems from the two divisions.

The GSD series 1 minicomputer offers considerably more flexibility in SNA networks than the traditional solution offered by DP division. Since the announcement of the 8100, DP again has the edge, but in some applications GSD's System 34 and new System 38 are competitive with the 8100. Again, DP is now offering a word processing alternative, the 3730, to Office Products' office system 6.

Chairman Frank Cary told stock analysts in San Francisco last week that products such as System 38 and 8100 were to some extent competitive.

"IBM's customers want alternatives, and that's the principal reason we want parallel product development in our systems. There certainly is some overlap between these systems, but each product has unique strengths."

Marketing vice-president Francis Rodgers explained IBM's policy of co-operative marketing between DP and GSD by saying that there would be contention but that it would take place in IBM offices, not at the customer site.

"If there is contention between sales forces in the branch offices, then there is an escalation procedure." This involves going up to the branch manager, and possibly on to the two regional managers and even Rodgers himself to get a decision on which product should be bid.

Observers say that the approach improves the odds in favour of IBM winning business. In general it appears that only one solution to a customer's problems will be bid, but there will be an alternative waiting in the wings if the customer seems to waver.

NEWS IN BRIEF

IDPM micro club plan

FOLLOWING the decision by the Institute of Data Processing Management to establish a microcomputer specialist group (CW, October 26), the IDPM is planning to set up a Micro Business Users Club. The suggestion has come from Commodore, manufacturers of the Pet computer.

Following its recent move to new premises, the IDPM is now on the telephone: 01-240 3304/5.

Scientific move

MORE effective communication with IBM head office at Portsmouth and the IBM development laboratory at Hursley, near Winchester, is the reason given by IBM for a decision to move its Scientific Centre from Peterlee, County Durham, to Winchester. The centre carries out research work in areas that include relational databases.

Takeover

DIGITAL transmission specialist Universal Data Systems, of Huntsville, Alabama, is to be bought by Motorola Inc. for about $22 million of Motorola common stock. Sales by Universal Data in 1977 were $5.7 million, and are nearly $10 million for the first nine months of this year. The agreement is subject to approval by the Universal Data stockholders in December.

£10,000 prize

TECHNICAL Development Capital's 1978 Innovator Award has gone to Domino Printing Sciences of Cambridge, the first all-British manufacturer of ink-jet printers. The £10,000 award is for the micro-based Unijet printer, which can use a variety of data sources.

Prestel to face stiff competition in the US

By Donald Kennett

ALTHOUGH the UK Post Office's Prestel viewdata service enjoys a 2/3-year lead over similar services operating in countries with nationalised PTTs (see page 5) it will be facing stiff competition in the US, where Texas Instruments and GTE, US telecommunication giant second only to AT&T, could be among those offering rival services. Prestel is being marketed in UK by the NEB's Insac, which is likely to go into service with one or more UK companies as partners (CW, June 22).

With more freedom of telecommunications than countries with State control of PTTs, there is likely to be a wider variety of competitive information services in the US covering teletext, viewdata, electronic funds transfer and electronic mail. The US telecomms watchdog, the Federal Communications Commission, is currently studying a variety of proposals.

Texas Instruments is currently working with the KSL TV station in Salt Lake City, Utah, on a test home information service similar to Ceefax and Oracle. Future plans include a viewdata service.

Coupled with TI's planned entry into the home computer market (CW, August 24), this provides backing to a recent prediction (CW, October 12) that companies like TI and IBM will come to dominate the Integrated Video Terminal market for integrated home video/TV/computer sets.

GTE has been working for about two years on an experimental home information system that, like Prestel, would hook up with a number of computers in different locations and also have its own built-in microprocessor for local educational and entertainment functions. GTE has been suggested as a possible partner of Insac in the US.

A spokesman for Insac told Computer Weekly it would be a month or so before a definite deal was announced but a short-list of companies had been arrived at and Insac was likely to find a partner, or possibly more than one, to launch a service next year.

● Prestel is to be demonstrated to Russian officials in Moscow on December 5.

Computerview — page 2.

Viewdata the exception

THE Post Office will now permit the attachment of video terminals with integral modems to its telephone lines for viewdata connections, but other data communications uses still require a separate modem.

Viewdata had been made a special exception to the "no integral modem" rule to allow television manufacturers to produce a single compact device at low cost, in order to enable it to reach a mass market. The definition hinges on the fact that viewdata information goes out from the Prestel computer to the user at 1,200 bps and at only 75 bps in the opposite direction for page selection and messages. A video terminal with two-way 1,200 bps capability does not qualify for exemption.

And so to bed . . .

WHAT, you may well ask, are these lovely young ladies from RTZ Computer Services doing with a bed on wheels?

The answer is that they are among the entrants to one of the biggest events in the UK sporting calendar, the Great Bed Race organised by the Chew Valley Round Table, in Somerset.

This is the first year that RTZ women have entered the race, and feminist fanatics will be dismayed to learn that they took two hours to cover the 10 mile course, compared with less than 1½ hours taken by the two male teams entered by RTZ.

It was all in a good cause — the Cancer and Leukaemia in Children Trust — and the RTZ teams raised £950 between them out of the £12,000 grand total chalked up by the 129 teams that entered.

Major change on cards for STC

DESPITE its outright rejection of the US government's proposal to merge STC with Plessey (CW, November 9), ITT appears to acknowledge that a major change is likely to happen to STC, ITT's UK-based subsidiary.

ITT has already put on the public market a 14 per cent holding in SEL, its West German subsidiary (CWI, May 5, 1977), and has indicated that it might be prepared to make a similar move in the UK with STC. Another possibility is that the NEB may seek a stake in STC, perhaps as part of a restructuring of the UK electronics and telecommunications industries.

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ICL in US deal with TRW

TO fill the marketing gap [illegible] closure of several of its [illegible] offices (CW, August 24), ICL [illegible] is negotiating a coast-to-coast dealership arrangement [illegible] TRW's service division [illegible] which the latter will become [illegible] largest single marketing [illegible] in the US for ICL's System [illegible] business computers and [illegible] terminals.

TRW already provides maintenance for all former Singer products in the US [illegible] cluding ones newly sold by [illegible] TRW acquired the rights [illegible] US base of System [illegible] machines before ICL bought [illegible] international operations [illegible] Singer Business Machines [illegible] later the US manufacturing [illegible] marketing operations for [illegible] 1500 line. ICL markets [illegible] former Singer product [illegible] of offices in San Francisco [illegible] cago, Washington and [illegible] York, and also sells the [illegible] in the New York area.

System Ten users [illegible] come ICL Inc customers [illegible] under one of the new [illegible]

'Black' action

ACTION over the bid by APEX members at British Aerospace's Chester [illegible] centre to gain recognition [illegible] their union looks likely to [illegible] to other BAC branches [illegible] management continues to [illegible] its policy of recognising AUEW/Tass as the negotiating union there. Following a [illegible] day stoppage at Chester [illegible] November 2), APEX members met earlier this week to discuss further action.

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Briefing

GEC bids for office market

BIDDING for a stake in the burgeoning office automation and commercial data processing markets, GEC has launched an agreed $100 million bid for office products manufacturer A. B. Dick of Chicago, and this week adds a commercial line to its 4000 series of minicomputers. GEC plans a marriage of its own microelectronics, telecommunications and computer technology with Dick's duplicators, copiers, word processors and ink-jet printers.

Privacy report soon

THE report of the Data Protection Committee is expected to be published within the next two weeks. Although the Queen's Speech did not mention a Data Protection Bill, it is understood that the government might still consider the possibility of such a Bill during the current Parliament.

Relaxing embargoes

SIGNIFICANT relaxation of the categories of equipment embargoed for sale to the Eastern bloc and China is likely to follow the first meeting for three years of Cocom, the Co-ordinating Committee on Export Controls, currently being held in Paris.

ICL talks resume

DISCUSSIONS between unions and management at ICL on the form the new self-financing productivity scheme at the company should take, are to resume on December 14, after a meeting planned last week fell through at the last moment.

It's Compec time

FROM December 5 to 7, London's Olympia exhibition centre will be buzzing with all that is new and best in peripherals, terminals, datacomms and the rest of the practical computing world. For it is Compec time again and if you are not yet geared up to join the swarm making for Britain's premier computing exhibition, which is sponsored by Computer Weekly, contact Iliffe Promotions, Room 521, Dorset House, Stamford Street, London SE1 9LU.

Chess sponsor

ICL is to sponsor this year's Hastings International Chess Congress — despite the hammering which chess-playing computers have received recently at the hands of human opponents. There had been doubt that the Congress could go ahead, owing to severe financial difficulties over the last few years, but now, thanks to ICL's help, it is definitely set for December 28 to January 14.

Pertec/Philips deal

A LETTER of intent has been signed by Pertec and Philips under which Pertec will take over management of the lease base of Philips' office computers and small business systems in the US.

The Times faces total impasse on computer system

By Rory Johnston

A TOTAL impasse over the manning of new computer equipment is the key factor likely to lead to the shutting down on November 30 of The Times and the Sunday Times.

Talks that were to have been held last week between the compositors' union, the National Graphical Association, and management were called off because of a disagreement on principles, and no chance of their restarting can be seen.

Management is insisting that the NGA agree to talk to other unions, particularly the National Union of Journalists, about handing over at least part of the keyboarding work hitherto done by NGA men. The NGA, on the other hand, while agreeing in principle to the introduction of new technology, is insisting that its members would be the only people allowed to operate the new VDUs, thereby obviating the main purpose of the equipment.

The NGA is emphatic that it is not against the introduction of new technology. "We can't stand in the way of progress," Bob Edmead, deputy Imperial Father of The Times chapel told Computer Weekly. "We welcome new technology, provided that what has been our function up to now will always be our function." This refers to his union's objection to the "journalistic front-end" system favoured by The Times management, in which reporters and telephone girls type directly on to VDUs rather than on typewriters.

If journalistic front-end were introduced at The Times most, but not all, of the compositors' jobs would be eliminated. "This is a fight for survival," says Edmead, while agreeing that the union will accept some reduction of staff.

Most of the hardware for The

● Turn to page 4

Spurring the Blues

Leading nationwide recruitment consultants Computer People Ltd, a member of the VLI group, took a step into the big-time football arena last Saturday when they sponsored the First Division game between Chelsea and Tottenham Hotspurs at Stamford Bridge.

Smiling before the game, which they lost humiliatingly 3-1, leading Chelsea stars joined VLI's 200 guests to present to VLI a Chelsea sponsor's mirror. In return, VLI gave the Chelsea players a magnum of Champagne.

Our photo shows VLI managing director Rupen Sayfield (right) receiving the mirror from (left to right) greying ex-England goalkeeper Peter "The Cat" Bonetti, Chelsea's current skipper and England star Butch Wilkins and Chelsea's latest signing, Duncan McKenzie.

After the game, Sayfield managed to maintain a balance between being "sick as a parrot" and "over the moon". For although he currently sings the Chelsea Blues, as exclusively revealed by Chad (CW, September 7), his first First Division love was Spurs.

Unions tackle new technology internationally

AN international trade union conference last week adopted recommendations aimed at providing guidelines for agreements on the introduction of new technology, including the safeguarding of employment through negotiations for "shorter working lives" and the need for trade unions to be involved in "participative systems design" exercises "to avoid the negative effects on people's jobs of the wrong sort of computer-based technology."

Organised by the Geneva-based International Federation of Commercial, Clerical and Technical Employees, known as FIET, the conference in Vienna took a neutral line on the intrinsic desirability of computerisation, but it highlighted some of the dangers posed by the new technology, stressing the likely impact it might have on females, particularly married women.

The conference concluded that "millions of jobs" were likely to be lost in administrative clerical and related areas and trade union action was needed to counter this, including the vetoing of redundancies caused by the introduction of new technology and a push for expansion of new job opportunities in the service and technology-related sectors.

It called on the Internatio-

● Turn to page 19

Rift with third world warning

MASS confrontation with the third world is a danger we risk by applying rigid regulation to international telecommunication. This was the warning given by John Eger, former head of the US President's office of telecommunication policy.

Giving the keynote speech at the annual conference of the telecommunication managers division of the Institute of Administrative Management in Coventry, Eger called on telecommunications managers to make their company top management aware of the impact of microelectronics technology on our economic and monetary systems, and resist the effort of those who would make it necessary to seek permission to send a message across a national boundary or require a licence to perform data processing.

Microprocessor technology

● Turn to Page 2

IBM replacements

REPLACEMENTS for both its CICS teleprocessing monitor and IMS database system are expected to be announced by IBM within the next six months, for release early in 1980. It is understood that the software will require application conversion and will represent even further unbundling of database and TP functions from the operating system.

Premier to speak on impact of micros

THE Prime Minister will make a major speech on the impact of information technology when he attends the next meeting of the Neddy Council on December 6 to receive a presentation from the electronics components working party.

It is understood that he will draw on the more positive aspects of the Acard reports on new technology, the third of which, on the social impact of microelectronics, is expected to be published early next year.

This report is likely to include some of the pessimistic predictions of high unemployment caused by automation, made in a report to the DoI.

Sources close to Acard also suggest that this report has been redrafted once because it was initially too negative. This is strongly denied by official spokesmen.

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COMPUTER WEEKLY'S INSIDE NEWS

BROCHURE PUFF

Bright, glossy brochures and crisp marketing words are the tools of the product selling trade. But do they provide potential users with the most relevant information in a readily accessible form? Nicholas Enticknap examines one user's close encounter of the marketing kind. page 12

TRADER REVEALED

Talking of sales and marketing, this week Computer Weekly reveals the identity of Trader, whose regular Sales Bit column has provided a witty and perceptive insight in the world of the salesman. To mark Trader's revelation, his regular readers get a double helping this week. pages 14, 61

ON THE BUSES

It was Spike Milligan who pointed out that, however important people might be, only a bus can grow up to be 88. In the micro world, the most popular bus number is S-100. Dr Richard Stevens explains why in Micro News. page 15

RELATIONAL SERIES

Our popular relational database series by Max Stewart has reached part 5, which is all about file implementations. page 22

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Editor
Malcolm Peltu 01-261 8033

Deputy Editor
Tony Higgins 01-261 8666

Advertisement Manager
Harry Hutson 01-261 8022

Class Ad Manager
Brian Durrant 01-261 8687

IPC Electrical-Electronic Press Ltd, Dorset House, Stamford Street, London, SE1 9LU.
Telephone: 01-261 8000.
Telegrams/Telex: 25137 BISPRS G

Branch Offices:
Birmingham: 202 Lynton House, Walsall Road, Birmingham 22B
Telephone 021 356 4838

Manchester: Statham House, Talbot Road Stretford, Manchester M32
Telephone 061-872 4211

New York: 205 East 42nd Street New York NY 10017
Tel (212) 867 2080 Telex 421710

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Members of Computer Weekly staff may be contacted directly on the extensions listed below. Other departments in Dorset House may be obtained by dialling (01) 261 8000.

EDITORIAL

Keith Jones	261	8344
Tim Palmer	261	8081
Peter Howlin	261	8303
Rory Johnston	261	8028
Martin Banks	261	8808
Robin Webster	261	8170
Bernard Allen	261	8038
Donald Kennen	261	8716
Mike Marples	261	8042
Dan Mitchell	261	8042
Chris Youett	261	8843
Nancy Pocock	261	8643

ADVERTISING
Display

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Stuart Moore	261	8108
Steve Bass	261	8026

Manchester
Harry Aiken 061-872 4211

Birmingham
Ken Parrott 021-356 4886

Classified

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Eddie Farrell	261	8007
Mark Williams	261	8019
John Ferrar	261	8088
Josie Poole	261	8174
Nanette Gibbs	261	8174

Manchester
Owen Kelly 061-872 4211

Birmingham
Basil McGowan 021-356 4838

Production

Ian Carter	261	8016
Ken Wolford	261	8878
Roger Albury	261	8818

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Support your local training action group

"IT is a crying shame that in an area such as Merseyside with its high unemployment record there should be a desperate shortage of computing staff."

These words of Littlewoods DP director Mike Jarvis could be echoed around the country. In Merseyside, however, there is now a local action committee (see page 3) which aims to do something to solve that problem instead of merely being part of the bellyaching chorus of computer users, manufacturers and systems houses which are finding it difficult to find suitable staff.

Speaking at the meeting in Liverpool which gave birth to the action committee, Jarvis correctly identified the origin of the current situation: DP management's failure, ten years ago, to forecast their future needs, and the cut-back in training which took place in the early 70s when the computing industry faced its only recession so far.

"We deserve to be penalised for these failings," Jarvis bravely stated.

And everyone involved in managing computing projects can testify to the painfulness of the retribution for those early 70s sins.

"Even if we run quickly in training new people, demand is running four times faster," Jarvis pointed out.

Although nobody explicitly said so at the Liverpool meeting, there was general agreement that the computing community has severely complicated those self-inflicted wounds of the early 70s by taking a far too narrow view of the type of people to be recruited into the industry.

In the early 60s, computing was noteworthy for its ability to recruit into the embryo industry people from a wide range of backgrounds and academic qualifications.

But the industry forgot its heritage as it grew; forgot that many of its ablest and most successful members would fail the current "graduates only" policy of many companies.

Sanity, however, is beginning to return. For example, this year for the first time in many years ICL is once again accepting A-level standard recruits, and Jarvis said that Littlewoods was considering even relaxing its current A-level minimum for trainees it accepts on to its own training course.

The destruction of the myth that it requires a graduate-level, maths-oriented talent to make a good business programmer or analyst could be the turning point in overcoming the current staff problem shortages.

Director-general of the Computing Services Association, Alan Benjamin, who is to be congratulated for acting as a catalyst in getting the Liverpool meeting organised, also correctly stressed the failure of the educational system in general, despite isolated examples, to instil sufficient practical business analysis and project management training into computer courses and the failure in schools and further education to offer courses giving a better understanding of the nature and potential use of computers outside the maths and computing science stream.

Staff in the education system can rightly argue that, at a time of educational cutbacks, it is unfair to ask them suddenly to expand one sector of education without their being given more resources or even more severe cuts being forced in other areas.

The computing industry — users, service companies and manufacturers — must therefore shoulder some responsibility in providing additional educational and training resources. This can be done by individually or collectively following Littlewoods' example in increasing in-house training or by offering practical financial or resource assistance to educational establishments.

Computerview exhorts other areas to follow Merseyside's example in establishing a "grassroots" action committee to tackle the local problem.

These grassroots movements will also eventually lead to a realisation that, as Computerview frequently argues, some of the problems posed by information technology can only be solved by effective, co-ordinated national policies, as outlined at the historic Hedsor Park meeting (CW, July 14, 1977).

FOCUS

Evaluating the DP staff

FILLING-IN end-of-year personnel assessment forms is a task currently occupying much company management time. For the DP manager, however, the exercise is very much an occupational hazard.

While the compiler battles with overall performance assessments and categorises such activities as delegation, enthusiasm, willingness and sundry strengths and weaknesses, the thought could well occur as to who was in fact being assessed.

Often it is the DPM who has to be motivated into completing the personnel performance end-of-year reviews. This motivation frequently takes the form of an irate phone call from the company personnel director requesting the long overdue returns to be submitted by the very next day — at the latest. Rational, constructive and logical findings in such circumstances are seldom in evidence.

Has the compiler achieved the required output, accuracy and neatness? Does the overall assessment equate with the individual score marks listed? It is certain that considerable enthusiasm, planning and self control are required qualifications for tackling the project, plus a certain dexterity with words. All too few computer sections are sufficiently remote from their company to enjoy specially designed DP appraisal forms. More often, the form is a standard issue covering all company activities from the car park attendant to the work's nursing team and senior financial adviser.

In between sits — rather uncomfortably — the DP team. Contrasts abound. The DPM, rather than using the assessment to apportion blame on the senior analyst for the botched-up user application, prefers to eliminate the responsibility of the DP team. As a result, the analyst could get a high performance rating, particularly where liaison with "difficult" user departments are involved. Shifting the blame is an opportunity to be seized with relish.

Timing has always seemed to Focus to be a critical factor of assessment ratings. Completing a report on members of the operations team following a particularly hairy 24-hour series of problems, snags and downright inefficiency, does not lead to rational evaluation — especially if the DPM himself was summoned from the depths of Surrey at 4.30am. A period of grace for all concerned should be the recommended procedure.

When it comes to assessing the data prep and control personnel, the DPM soon finds himself floundering. The qualities he may admire in the latest input operator may be more based on her general configuration and presentation than work performance.

Just about the only area of assessment forms where the DP team scores heavily are those of training. Few other company divisions spend so much time, money and effort on courses, seminars, workshops and education. Where the programmer may well lack assessment in areas of motivation, self-control, delegation, he definitely scores on his training performance.

INTERRUPT

ONCE upon a time there was a dear little Fortran compiler that could do nearly everything in the ANSI standard. It could do all sorts of clever little tricks like realising that CALLIT (7H) = SIN(X) is (of course) a subroutine call.

Unfortunately, users started to complain that this compiler quite correctly allocated four bytes to all integers, while the hardware was quite capable of handling one or two byte integers. Hence the compiler was "improved" to allow INTEGER*2 declarations (or *1 or *4, and to save typing INTEGER* was allowed as an alternative to INTEGER*2). Users then happily declared INTEGER*2 FRED and saved some space (and time, since half word instructions were faster); in fact most users were idle and declared INTEGER* FRED, but either way all were happy.

Eventually a poor innocent user declared INTEGER*2 HORROR, only to get indignant complaints from the compiler later in his program that implied that HORROR hadn't been declared. He eventually traced the problem to the dear little compiler proudly converting 2HOR into a string, and declaring INTEGER* 'OR' ROR, getting confused by 'OR' and deciding to ignore it in the hope it would go away.

The moral is that when you let your software grow, make sure its boots are big enough.

● **Submitted by Hugh Stewart, of Shape Data Ltd, Cambridge who wins this week's £5 Interrupt prize.**

Ten years ago...

COMPUTER WEEKLY **NOVEMBER 21, 1968**

A DECISION by Barclays Bank to replace its order for a Burroughs B8000 with one for three B6600s was based on doubts whether Burroughs could deliver an operative and proven B8000 in time, and the need to integrate its Martins Bank subsidiary quickly . . . The largest PDP-8/1 yet produced was installed at the Strand Palace Hotel Group's computer centre, near Piccadilly Circus . . . Expenditure by the Universities Computer Board on hardware, buildings and running costs topped £3 million . . . At a one-day conference held at the Institute of Electrical Engineers, delegates from the building industry, local government and higher education were urged to use the Genesys structural engineering package . . . Edinburgh University received its ICL System 4/75 a year late.

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Bureau puts faith in future of 2900 series

STRONG confidence in the future of the ICL 2900 series was expressed last week by Safe Computing of Birmingham, a Chubb subsidiary, when opening a new bureau service based on an ICL 2960.

The Safe 2960 has already been operational under VME/B for three weeks. Smooth transition from the previous ICL system was also helped by extensive pre-installation experience the Safe team gained at another bureau.

This involved converting programs already run for Chubb, Lock & Safe, a process in which ICL manuals were found extremely helpful.

Peter Turner, head of the software team in Safe's Software Services Division, admitted that computer press comments on VME/B had made his team apprehensive.

"In fact, the exercise has been remarkably painless. We have found it particularly heartening that each new issue of VME/B brings really substantial improvements in performance."

"At the bureau, they [illegible] under the 5X24 version, but are on 5X27 and the [illegible] throughput has been dra[illegible]

Third world

● From front page

had outstripped the [illegible] our political systems. [illegible] It, he said, and we [illegible] allow government bureaucracy and regulatory agencies [illegible] international control [illegible] control of telecommunications.

Next year, he said, the International Telecommunication Union would have the power and the opportunity at a conference to change the rules of international telecommunication, and it [illegible] remember that at previous conferences third world countries had voiced fears of being locked out of satellite communication.

Right now, Eger said, 90 [illegible] the radio-spectrum is used to serve only 10% of the world's population. The third world countries wanted their [illegible] now even if they were not able to use it yet. Their alternative [illegible] to use obstructive [illegible] votes which would [illegible] West's options very narrow.

Chinese leader at ICL

HOPES are high at ICL that significant computer business in China will follow from Vice-Premier Wang Chen's visit to the company last week. Our picture shows the Vice-Premier being introduced to ICL chairman Tom Hudson, (right) by government hospitality representative Neville Coppel (centre left), while Bill Grant of the British Overseas Trade Board (centre right) looks on.

Following the Chinese Vice-Premier's visit, a joint declaration of intent was made to boost aggregate trade between the UK and China from today's $200 million to a cumulative figure of $8,000 to $10,000 million. The agreement does not specifically mention computers, but refers to advanced technology equipment.

Despite the agreement, which should get a boost from a decision to sell China the Harrier tactical vertical take-off fighter, companies will still have to compete for business.

German and Japanese companies, notably Siemens, Hitachi and Nippon Electric, have a head start in China, but the Chinese, who already have two aged 1900s (CW, November 16) have expressed particular interest in ICL's 2900 series, on which they were briefed by the company last week.

Another member of the delegation, Minister of the Chinese State Science and Technology Committee Liu Hua-Ching, signed an agreement on technology co-operation with Foreign Secretory Dr David Owen, and this agreement did mention computer technology. It is likely to lead to proposals for exchange visits and to training.

Insac stake in RTL/2 for Series 1

WITH SPL's development of an RTL/2 compiler for IBM's Series 1 minicomputer virtually complete, the government's software concern Insac has decided to take a stake in the project.

At the same time, Insac has announced that it is to open an office on the West Coast of the US. This will be headed by Michael Strong, previously vice-president of Martin Marietta Data Systems on the West Coast.

Representing its second joint-venture with a member company, Insac is to contribute funds to the marketing, development, and maintenance of the RTL/2 package in return for a share of sales revenue. The software is due to be released in January.

Insac's first deal to be announced was also in partnership with SPL and covered the development of interactive graphics software for Calcomp's IGS-500 system (CW, September 21).

Merseyside action call to overcome staff shortages

AN action committee of computer users, systems developers and educationalists is to be established in Merseyside to co-ordinate local plans aimed at increasing the available pool of skilled computing resources.

The committee was established following a meeting in Liverpool last week held under the auspices of the Computing Services Association and attended by representatives from local computer staff, employers, and educational establishments.

Mike Jarvis, DP director for the Littlewoods organisation, identified the key factor in the current shortage of computing staff as being the fact that employers are "fishing in the same pool of experienced staff but are doing very little to increase the size of the pool."

Alan Benjamin, director-general of the CSA, pinpointed the scale of the problem by reporting that, among members of his association alone, there was a requirement for the employment of 2,600 new graduates next year, yet there were only 1,400 computer science graduates coming out of the universities.

And Jarvis warned that experienced computing staff "just aren't there" in the numbers currently required.

Littlewoods has therefore established its own training school with 50 places, and although Jarvis accepted that some of those trained by the company would leave to work elsewhere, he said, "We must bite that bullet," as it was important to tackle the problem at its roots.

Jarvis' attitude struck a responsive chord at the meeting, helping to crystallise a consensus view that action has to be taken to widen the sources of recruits to computing and to provide an impetus in industry and the public educational system to increase relevant training and education.

Benjamin stressed that computer systems suppliers and users should make it widely known that graduates other than from computer sciences and maths can make excellent computing staff and Jarvis stressed that Littlewoods' training scheme successfully took A-level recruits. There was also widespread praise at the meeting for the National Computing Centre's Threshold training scheme for unemployed school-leavers.

Benjamin said that training in the use of computers in non-computing science faculties and in schools in general was "derisory", and he strongly criticised computing science departments for failing to inject more practically relevant subject matter into their courses, such as project management, and business systems analysis.

However, Professor M. Sinmpford, head of the Liverpool University computational and statistics department, said that while he agreed it would be desirable to extend education in the use of computing to other disciplines and to increase the commercial DP content of computing science courses, universities had been faced with a "negative growth in resources" in recent years.

Representatives from local polytechnics also pointed out that sandwich courses, which have been praised by industry, often had to be closed through lack of industry support in employing "part-trained" staff.

The meeting, which had the support of the Lady Mayor of Liverpool, resolved to establish a local committee to draw up plans to solve the immediate and long-term problems.

● Anyone in the Merseyside area wishing to participate in the work of the action committee should contact Heywood & Partners Ltd, 30 Exchange Street East, Liverpool.

Computerview comment, page 2.

Do you know him?

CAN you help trace the brother of a Computer Weekly reader? Mr J. C. Hines, who lives in Lymington, Hants, lost touch with his brother Peter David Hines some years ago. Peter used to work as a programmer for Ferranti in Manchester.

There has been a death in the family, and Peter's brother would very much like to get in touch with him. If you have news of Peter, please write to CW and we will pass on letters.

Telenet switches are likely choice for PSS

THE hardware for the UK public packet-switched service, commonly known as PSS, has now been selected, and the decision has been passed on to senior management for approval. An announcement of the winner and go-ahead for the network to be built are expected shortly.

There were four contenders for the contract: Plessey with Telenet technology; Logica with Transpac-Euronet switches, Leasco with Ferranti hardware and Ferranti with Canadian Datapac switches.

The Post Office hopes to get the network into service by the end of 1979, and wants an X25-compatible switching system which is available off the shelf.

The problems which delayed the opening of the French Transpac network until the end of this year reduced the prospects for the Logica bid and swung the betting in favour of the Telenet Processors bid by Plessey (CW, August 10). These modular switches based on MOS Technology 6502A microprocessors (CW, May 26, 1977) still seem the most likely choice.

The Post Office has already installed Telenet Processors for the International Packet-Switched Service, still not formally announced, but by the time the national service is due to begin, should have had ample experience with the Telenet switches.

Laser optics plan

A LASER capable of transmitting an infra-red light beam with a wavelength of 1.2 micrometers down a fibre optic cable is planned for commercial production before the end of this year by Laser Diode Inc in the US.

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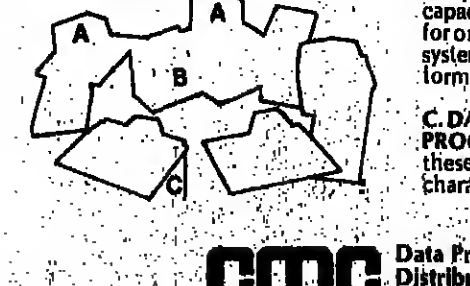
A. PROCESSING TERMINALS – these operate independently because of their (32 Kb minimum) micro-processors. Each can be used for supervisory functions, as a communications controller, or for the support of line or serial printers. Additionally users can create and run BASIC programs in interactive or batch mode, without interfering with system operation:



B. DISK/TAPE PROCESSOR – dedicated to ensuring optimum use of disk/tape channels. It responds to, and quickly services, disk commands from all other processors in the system. Disk capacity can be increased to 100 Mb for on-line storage of data batches, system files, entry and validation formats and user-programs:

C. DATA ENTRY KEYSTATION PROCESSORS – there can be four of these; each supporting eight (520 character) Keystations on one system.

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Downtime by Chad

Zip goes a billion

IT seems the US Postal Service is to make its Zip codes (post-codes) longer — nine digits instead of five.

Nine digits gives one billion different codes (1,000,000,000). There are 200,000,000 American people. Is the Postal Service thinking of giving every termite, ant, and caterpillar in the country its own code?

Why not? You'd heard of specism — like racism. Why shouldn't other species get the same look in as humans?

Opaque

A FASCINATING classified advertisement from the US magazine Saturday Review:

COMPUTER ERROR has resulted in 11,000 units of Venetian blinds with slots locked into darkened position. Good for businesses where speculation about what goes on inside is not a disadvantage. Reply Box VB.

We all know how computers are being made the scapegoat for every mix-up these days, but this item sheds little light on the matter.

Bowler brigade

I WILL have you know that these two young ladies are Scientologists. They look quite normal, don't they? The computer behind them, though, is not — it's made of cardboard and is being touted around the country to rally people to the cause of the Freedom of Information Campaign. The girls are dressed as civil servants, not stockbrokers, and according to the National Society for Crime Reduction and Social Justice (sic), this is what they do:

"The lovely 'civil servants' asked members of the public lists of typical, useless bureaucratic questions, which were then fed into the talking computer which cascaded passers-by with red tape and blurted out the kind of inaccurate and sometimes false information that creeps into official files on individuals, and which can follow them through their lives."

Their newspaper headline screamed, "EVERYBODY WANTS FREEDOM OF INFORMATION".

Good traditional Rag Day stuff, eh? I would have thought all this would do is convince people that what they want is a Freedom *from* Information Act.

No half measures here

"BUS driving" . . . . "address decoding" . . . refresh cycles" . . . . "bit-slice cascading" . . . . the jargon comes drifting across from Martin Banks' corner of the office, until my eyes glaze over and strange uncontrollable thoughts well up in my mind, such as, "Is the bus driver on a one-man operated vehicle a semi-conductor?"

The award of legal recognition for a program specification is a significant step in the history of computerised payrolls. CLIFF DILLOWAY examines the reasons why it has become necessary to grant legal status to the published formula for PAYE calculations.

He is a consultant to the Q-Pac Payroll System and chairman of the BCS Payroll Policy Committee.

Legal at last—after 25 years

THE year 1978 has not been a good one for the payroll programmer. What should have been a smooth transition to contracted-out national insurance contributions in April produced below the surface ripples, about which the least said the better.

The Finance Bill did not contain any unexpected changes, although changes there were. The lower rate of income tax was expected, but doubtless the changes caused problems here and there as they came to be implemented. It's easy to say that an extra tax band at the bottom should really not cause any more of a problem than all those existing bands at the top of the tax tables.

However, the band at the bottom applies to everybody and the bands at the top to only a few. Ergo the little weaknesses showed up and all had to be sorted out; always, it seemed, in the middle of the night.

Then, while the Finance Bill was going through Parliament, the Opposition were able to get their oar in and change the basic rate of tax as well as the band of income to which it applied. In November these last changes are still working their way through the tax system, but after that things should settle down until next April.

Cliff Dilloway, chairman of the BCS Payroll Policy Committee.

Or will they? The Specification for PAYE Tax Routines is being simplified. The simplification is a real improvement, as it means taking out a whole complicated routine that was not mandatory anyway. One up to those who had never put this routine in in the first place.

The big change, however, is one of form, not of substance. From April, 1979, the good old Specification for PAYE Tax Routines will be solemnly declared by the Board of Inland Revenue to be a tax Table under section 204 of the Income and Corporation Taxes Act, 1970. Calculations carried out according to the specifications will determine the amount of PAYE to be deducted with all the force of the law.

As with national insurance there will be two ways of calculating PAYE, and the 5p or 10p differences between the two methods will have statutory cover, rather than administrative tolerance.

The other way of calculating PAYE is, of course, the use of the now voluminous manual tax tables. The introduction of reduced rates of tax has required the production of tax tables for every week and month of the year. It is really the complexities that flow from handling reduced rates of tax that has broken the tradition that the computer will always produce exactly the same result as the manual calculation.

A specification for PAYE Tax Routines was first issued by the Inland Revenue in 1953. Now after 25 years it has obtained legal recognition as a correct way of calculating PAYE.

When the specification was first published PAYE was only nine years old, and it was straightforward to specify how the calculations could obtain the same results as the manual tables. Then 12 years ago the 5p or 10p difference between the manual tables and a computer calculation crept in.

Searching after precision, in 1975 the Inland Revenue issued an extended specification designed to enable computer programs to be written that would produce results that exactly matched the tax tables. The extended specification was however, optional — it had to be; some computers would not have had enough memory to accommodate its ramblings.

Now the computer specification will stand on a par with the older manual table.

The government and Inland Revenue have a policy of simplifying tax matters and the granting of Tax Table status to the Specification for PAYE Tax Routines is a small step toward that end in the deepest complexities of computer programs. The effect on any one pay packet may be 5p or 10p, and that is automatically corrected in the following pay packet under the cumulative tax system.

Of less wide impact and in an entirely different field is the announcement from the Department of Social Welfare in Dublin that the Dail is considering the Social Welfare Bill to change the basis of social insurance contributions. At the time of writing few details are available, but new contributions from April 1979 appear to follow the format of the UK national insurance contributions.

Impasse at The Times

● **From front page**

Times system has already been installed. It is similar to that recently brought in at the New York Times (CW, September 21) and many other US papers, where there has been bitter confrontation and the takeover by low-paid staff of many jobs formerly done by high-paid union men. This has often involved closing down a paper, bringing in the equipment, and then hiring new people off the street to operate it.

The Times management is adamant that this is not the intention of if impending closure. "No way is this an insidious way of getting in new technology," said a spokesman, explaining that the November 30 deadline was necessary to stop negotiations dragging on for ever. On the other hand, The Times chairman, "Duke" Hussey, hinted on television recently that he was sure that, if necessary, he could find someone to operate the equipment.

Barry Fitzpatrick, Father of The Times NATSOPA chapel, whose members are largely Press operators and clerks, agrees it is unlikely that the management have this in mind. He points out that the union situation in the US is very different from the UK, where unions are stronger and more ready to co-operate. On the other hand, he doubts that the new equipment is capable of doing the job, since shop floor workers were not consulted over its design.

The fundamental impasse remains journalists' input. The NGA regards the input of text into the printing process as a skilled technical job, with undeniably ... machines, and ... continue to be ...

Euro leasing firms pressurise IBM

WITH the main aim of putting pressure on IBM to be more co-operative, leasing companies all over Europe have set up the Computer Leasing Association. The association met for the first time last week at Heidelberg, Germany, and plans to increase its membership from the present 17 to more than 40 when it meets again in Las Palmas, Canary Islands, at the end of January. The 17 members at Heidelberg voted to send letters to another 24 companies inviting them to join the association.

One of the founder members, Phil Cousins of IBL Computers of Ascot, told Computer Weekly that the association intended to negotiate with IBM over matters like the facilities IBM in the US makes available to leasing companies there, and which are not forthcoming in Europe.

One important example he gave was IBM's approach to installing second user machines, which is far more co-operative in the US.

According to Cousins, IBM in the US installs a second user machine for a fixed price and is prepared to work on a 24 hour-a-day basis to complete the job. In contrast to this, IBM in Europe is only prepared to do the job during normal working hours and will charge for additional facilities.

The association will also put pressure on IBM to make price lists and copies of the Consultant's Handbook available to leasing companies in Europe in the same way that they can be readily obtained by leasing companies in the US. The Consultant's Handbook provides specifications of IBM products.

Cousins pointed out that leasing companies in the US had been organised into associations and pressure groups for a long time. This was the main reason for IBM's much more co-operative attitude over there. The Computer Lessors Association had existed for five or six years, while the Brokerage Association had about 5,000 members.

Apart from IBL Computers, leasing companies that already belong to the association included Greyhouse, Itel, Tiger, CIG, the German firm CSC, and Premier Computers. Premier's marketing director, Peter Doyle, is the first president of the association.

The first exclusive exhibition in Europe for the leasing and second user market, Martex '79, is to be held next March at the Felbridge Hotel, East Grinstead, Sussex.

Recruiting for micro market

A RECRUITMENT service has been launched to help companies and organisations find staff in the microcomputer and related fields. Called Interlex, the new company has headquarters in Southampton and is headed by Mike Lane.

"We aim to provide a recruitment service covering anything associated with micros, from systems designers to chip designers," he told Computer Weekly. "We also intend to provide a support service, ranging from programmers and designers to draughtsman."

"I hope we will be able to attract some of the expatriates who have moved to the Continent and elsewhere back to the UK now that the market is really taking off," he added.

Interlex can be reached on Southampton 28191, telex 477867.

IBM-Xerox office automation war hots up

COMPETITION between IBM and Xerox in the office automation market is hotting up with the announcement that Xerox plans to introduce a satellite communications service for voice, data and facsimile.

The plans, exclusively forecast in Computer Weekly (November 2), differ significantly from those of IBM's Satellite Business Systems: the proposed data rate is lower and microwave links would be used to connect customer sites with satellite earth stations.

The Xerox Telecommunications Network, XTEN, would be operated by a yet-to-be-formed subsidiary, and in the 10 GHz frequency band, transmitting at up to 256K-bps. Satellite Business Systems plans 12-14 GHz transmissions with service at up to 1,544K-bps.

XTEN would involve customers installing earth stations, where SBS' plans call for customers to install small earth stations and communicate directly with the satellite.

Xerox plans call service between the largest US cities by late 1981, and eventual service in some 200 major conurbations.

SRC robotics research

SPECIAL arrangements for promoting research into robotics and "robust" software are being considered by the Science Research Council. The Council is pleased with the success of the "directorates" it has set up in other fields and may establish others in these important areas of computing.

A directorate is an organisation headed by one man at SRC headquarters who looks after the research in one particular area, and deals with all project proposals connected with it. This is felt to be more efficient than placing all proposals before one general committee without specialist expertise. Directorates currently exist in Polymer Engineering, and Marine Technology.

The Council also has plans for a new training scheme for "technological topping-up" of people already working in industry. This would complement its other training schemes, such as that for short-duration collaborative training awards with industry, which is just getting started.

In its annual report, the SRC points out the enormous difficulty of completing its existing projects on the shrinking budget it has been given.

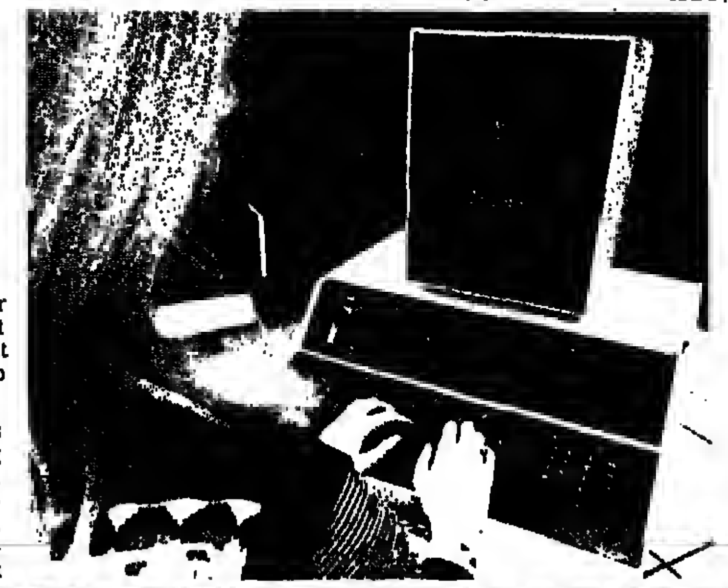
Factory data collection

INDICATING that it plans to expand in the factory data collection business, ICL has announced that it is introducing a family of such systems, the 9600 series, early next year.

ICL inherited a group of factory data collection terminals, the Models 100 and 105, from Singer Business Machines when it took over Singer's customer base two years ago. But ICL has decided to go to an outside company, Feedback Data of Uckfield, Sussex, for the terminals that will be used with the 9600.

Feedback Data, an established factory terminal manufacturer, has developed versions of its equipment to ICL specifications and will supply ICL on a continuing basis depending on demand.

ICL is unable to provide any more information about the 9600 series except that 9600 systems will be compatible with the existing Singer kit, indicating that the Feedback Data terminals will be interfaced to 1500 or System Ten processors.



Big screen word processor

THE latest Burroughs word processor, pictured here, the Redactor II, is available in the UK both from Burroughs and from BDP Word Processing of Isleworth. Its most noticeable feature is the large screen, which can show 59 lines of 84 characters each, in contrast to the more usual 25 or so lines.

User programming is an optional extra on the Redactor II, allowing a complicated sequence of editing keystrokes to be recorded and then executed automatically. This, with its arithmatic functions, allows the Redactor to be used to produce invoices, purchase orders, financial statements, etc.

The large screen approximates the size of an A4 page, except when characters are displayed at double size, which they can be for ease of editing. Horizontal scrolling can show lines of up to 158 characters long.

Text can be stored on a choice of mini floppy discs, magnetic tape cassettes, or magnetic cards. Daisy wheel printers (with proportional spacing) and line printers are available.

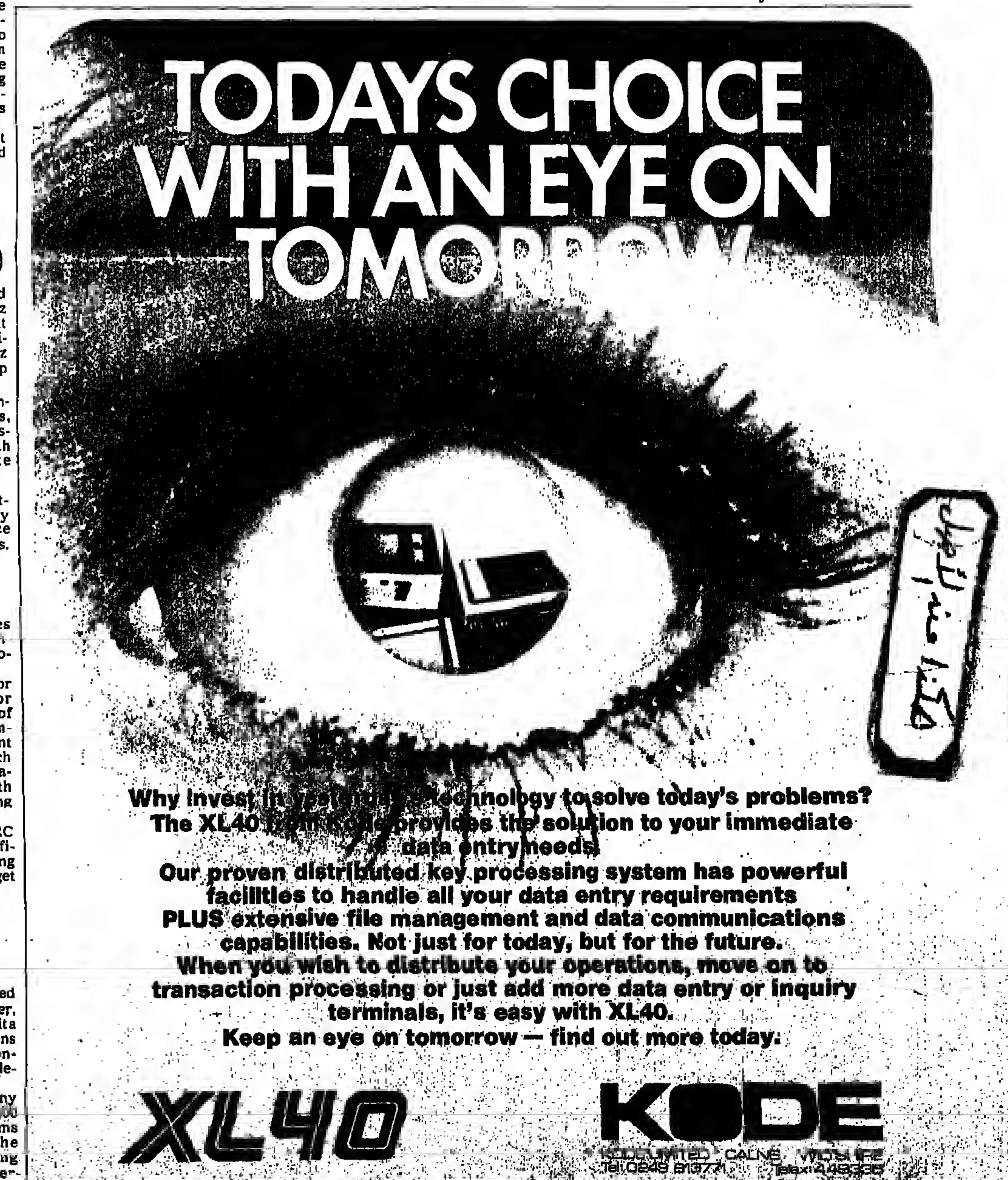
Pact with Level 6 from Zeus

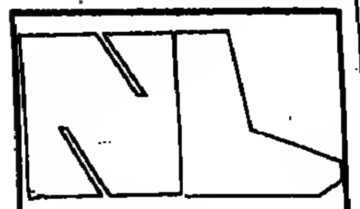
ZEUS-HERMES is close to completing the development of a packaged turnkey system for professional accountancy practices. Called Pact, Practice Accountancy and Control System, it is based on the Honeywell 6 minicomputer and was designed in conjunction with a firm of London accountants.

The system handles three main processing functions: time recording and billing, incomplete records processing, and partnership bookkeeping. In addition it can be supplied if required with software for processing sales, purchase, nominal ledger, and payroll.

In contrast with microcomputer-based systems, a major attraction of Pact is its upward compatibility, noted Zeus-Hermes, the modular architecture of the Level 6 permitting smooth growth of the system.

The Pact software is available in two versions: a single-user version and one which supports multiple VDUs working concurrently.





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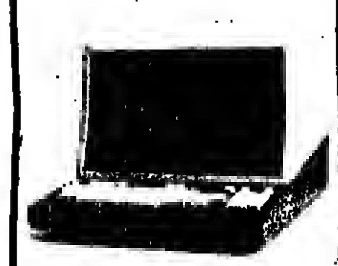

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MICHIE'S PRIVATEVIEW

Who sings 'Why can't a robot be more like a man?'

THE use of computers to implement processes of thought and understanding has caused the utterance of more rubbish than ever came out of Bishop Wilberforce. In 1860 this worthy debated publicly with Thomas Henry Huxley the newly published evolutionary theories of Charles Darwin. The level of debate can be judged from his question to Huxley as to whether he claimed descent from the monkeys through his grandfather or his grandmother. Even today, children of the American "Bible belt" are taught to sing:

"I ain't no kin to the monkey, no, no, no,
And the monkey ain't no kin to me.
I don't know much about his ancestors
But mine didn't swing from a tree!"

Regrettably we, the "artificial intelligentsia," are to blame for contributing our share of rubbish. Even in textbooks, definitions of the field can be found which equate artificial intelligence with computer solution of problems which would require intelligence if performed by humans. Let us test that definition.

Does a human use intelligence when doing arithmetic? Of course! Then according to the above definition machines became intelligent with the first floating-point package — a nonsensical conclusion.

It makes no difference that computers have now entered realms of complexity requiring high orders of intelligence from human solvers. Slate and Atkin's CHESS 4.7 program embodies little chess knowledge, and no capacity at all for generalised chess reasoning. But by dint of growing a tree of up to half a million possible future board-states in its analysis of each move it can without difficulty defeat 499 out of every 500 chess players in the world. Any one of these would surely have our sympathy were he to chant:

"I ain't no kin to the chess program, no, no, no,
And the program ain't no kin to me.
I don't know much about its thought processes,
But mine don't grow on a tree!"

A point of view, which I shall call technomorphic, goes as follows:

"The machine's way of going about chess, or weather-prediction, or plant control, or route-scheduling, is bound to be different and *ought* to be different. The relative costs and constraints associated with the various aspects of the problem-solving process are totally different for machines and brains. Strategies which optimise performance with respect to two such contrasted profiles are doomed to diverge. Whatever way is most efficient for the machine to do the problem, that's the way we want to go. If Karpov hasn't got the calculating speed and working memory to grow a lookahead tree of half a million board states, or if our top meteorologists aren't smart enough to be able to do partial differential equations in their heads, that's just too bad!"

There is nothing wrong with the technomorph's first point. In the light of the brain's woeful disabilities as regards store and processing speeds, efficient machine programs are not likely to make workable representations for people, nor vice versa. Where the technomorph goes wrong is in supposing that there is no other criterion involved but *machine solution-efficiency*.

Space permits one counter-example to the technomorphic fallacy. The example I have chosen, from robotics, is elementary. But it makes the point.

R & D on robot vision makes use of colour sensing. Technomorphically this is no more than measuring the wavelength of light reflected from each surface point of the scene, encoding it as a real number.

For summarising and classifying, however, it is convenient to break the colour spectrum into a small number of separate segments. Although the range is continuous from red to blue and from white to black, this is what the biological system does. The names which people give to the segments are the colour-names white, black, red, yellow, green, blue, orange, purple, brown and so forth.

The roboticist could conclude that this is all pretty orbitrary, especially in view of the fact that different cultures draw different boundaries between colours, and that some languages have numerous colour names and others have hardly any.

Our technomorphic engineer now commits himself to a system of colour filters which breaks the spectrum down in a way which optimises some parameter of engineering cost or convenience. Belatedly he hears of the neurophysiological discovery that the human visual system organises the spectrum into opposing pairs of primaries, red/green, yellow/blue, black/white, in a way that appears to be "hard-wired" and which lies at the basis of linguistic norms and colour perception across all cultures. What finally sinks him is the difficulty of communicating colour concepts between user and robot which kills his market.

In "My Fair Lady" Professor Henry Higgins bursts into plaintive song: "Why can't a woman be more like a man?" Today, of course, she is, and I trust that the Higginses of this world feel better satisfied. I trust, too, that we shall not hear a new song, a lamentation of future customers: "Why can't a robot be more like a man?"

Donald Michie

Performance monitor for DOS/VS users

A PERFORMANCE monitor for DOS/VS users and a utility for dumping and restoring logical VSAM files under DOS/VS have been announced by Westinghouse Management Systems.

Explore/Discover is a two-part performance monitor, which Westinghouse says provides an attractive alternative both to the traditional trial and error method of system tuning and to expensive, and bulky electronic monitors.

Explore gathers data direct from the hardware in real time, measuring CPU utilisation, channel utilisation, CPU-channel overlaps, paging rates and so forth, and produces various status reports. It also warns of bottlenecks in the system such as "printer out of paper" or "tape not mounted."

Discover provides raw data on the performance of disc data sets for use in system tuning. It is claimed that the user can install it, that it requires no modifications, and that the overhead is from 0.5% to a maximum of 3%.

Faver, Fast Virtual Export and Restore, is a utility for dumping and restoring logical VSAM clusters. Key feature is that it dumps — or "exports" — only the VSAM clusters, ignoring the free and unallocated space. It is designed to preserve the synchronisation between master catalogues, user catalogues and data spaces, and identifies the data on tape by cluster name rather than relying on its physical position on tape.

Catalogues can be exported in three ways: all clusters defined in the indicated catalogue with optional named exclusions; all clusters in catalogue indicated residing on named volumes, again with optional named exclusions; and by named clusters. They can be restored in the same three ways.

Both products come from Goal Systems Corp, and both are available for free trial. Like all products marketed by Westinghouse, they are in use at 100 or more US sites.

Explore/Discover costs £2,560 purchase or £850 a year rental; Faver costs £1,880 purchase or £80 a month. If users already have, or decide to adopt the Westinghouse Disc Utility as well as Faver, the two products together can be had for £3,560 or £108 a month.

Westinghouse Management Systems is a subsidiary of Westinghouse Electric of Pittsburgh, with 32 employees and six offices in Europe.

Puzzler

IN ancient times, much thought was devoted to the possible significance of Verse 18 in the Book of Revelations:

"Here is wisdom. Let him that hath understanding count the number of the beast: for it is the number of a man; and his number is six hundred threescore and six."

Now, American mathematician Alan Wayne has formulated an intriguing alphametic that highlights the relationship between the mystic number, and the number of the verse itself,

SIX + SIX + SIX = NINE + NINE

See page 81 for the unique solution.

Query-By-Example UK launch by IBM imminent

IN a major step forward for its database users, IBM is understood to be on the verge of announcing Query-By-Example as an Installed User Program in the UK, following a similar introduction in the US (Software File, November 2).

The system, which runs as a user program under VM/CMS, is likely to cost about £180 a month. Users must, however, install VM Basic of Full System Extensions in addition to VM itself.

QBE, developed at the company's Yorktown Heights research laboratory, provides managers and other non-DP professionals with both query and update facilities which are regarded as far outstripping those provided by any competing product.

Although best known for its novel approach to data retrieval (see below), the system in addition caters for data insertion, deletion and updating. It also provides a full range of backup, restore, and security facilities.

QBE uses its own inverted file organisation, which allows indexing on any number of fields in a file.

In its current implementation the system is supplied with interfaces to OS/VS and IMS. These enable QBE files to be created from existing OS/VS files or IMS databases, one QBE file being created for each OS file or IMS segment.

QBE is essentially an interactive system, though it can be accessed from a PL/I Call or APL Shared Variable to permit more complex calculations. Totalling, averaging and similar operations are, however, available within the system itself.

One group which could find QBE a very attractive alternative is users of IBM's APL data manipulation and reporting packages such as AORS, ADI and ADL.

The software could also have a strong appeal under systems other than VM/CMS. Widespread interest in it could influence IBM to produce other versions, it has been noted, with TSO version running under MVS as the most likely candidate.

Aimed mainly at the inexperienced end-user

TARGETED primarily at the experienced end-user, Query-By-Example is a fully non-procedural facility which allows the user to specify his requirements by giving an example of the output required rather than defining it syntactically.

The query is described by completing entries in one or more displayed tables. When one or more entries have been made, QBE satisfies the query by filling in the remaining blank entries.

Each displayed table consists of a series of headings, in which each heading is the name of a field in an associated file.

In the simplest case, QBE is used to process a query against a single file.

Take, for example, a personnel file with fields EMPLOYEE-NO, NAME, AGE, SEX and SALARY. A request for the file will display on the 3270 screen the heading part of a table with those names as column headings.

To print the names and ages of all employees who earn more than £5,000, a user would type >£5,000 in the SALARY column. He would then ask for NAME and AGE to be printed by typing an example of each under the appropriate heading.

The examples need not be actual occurrences, but can be arbitrary values prefixed by a 'P'.

The query can easily be extended to include more complex multiple selection criteria such as SALARY >£5,000 but <£6,000 and AGE <60 or SEX = female.

The full capabilities of QBE become evident only when data is to be retrieved from several files at the same time. The key point is that files are linked by the system at the time the query is made.

It is in this respect that QBE represents IBM's first true relational database system.

Take, for example, a record but separate employee history file containing details of ABSENCES.

To post a query of the form "print the names of all employees who earn more than £5,000 and who have had more than 10 absences" the two files must be linked together.

● Turn to Page 7

Now Ada joins Pearl and Coral

"ADA" has been officially chosen as the name for the new real time language being developed by the US Department of Defence.

The name honours Lady Ada Lovelace who, as assistant to Charles Babbage, is regarded by many as having been the world's first programmer. It was agreed unanimously by ARPA's High Order Language working group, which is responsible for the development, and is being used with the permission of Lady Lovelace's heir, the Earl of Litton.

"Ada" was previously best known as Ironman, the title of the penultimate specification document for the language. It was usually described by the DoD as a common high-order language for embedded computer applications.

This summer, the DoD published a final specification for the language in a document called Steelman. Two companies, CII-Honeywell Bull and Intermetrics, are still being funded by the DoD to produce a design to meet the specification.

The announcement of the name follows the final scheduled design review meeting in Washington last week, which was attended both by the remaining contractors and by invited observers.

The two companies now have until mid-March next year to complete and deliver their work.

2900 version of Filetab

THE National Computing Centre has released a native-mode 2900 version of its Filetab data management and reporting utility. Running under the VME/B operating system, the package is available both in Level 5 and Level 6 implementations.

While 1900 and 2900 Filetab programs are essentially compatible, some conversion is entailed for those migrating, notably to cater for new 2900 file types. A syntax checker is provided with the package to check that programs have been converted correctly.

Some 20 users have already installed the new software, according to the NCC.

Enhancements

A HOST of software enhancements is being planned by Wang for its 2200 VS systems. High on the list is a database management system, with one or more query languages, and compilers for PL/I and Fortran.

PROGRAMMER NOTES

Assertion of invariance

AN article on the use of assertions and invariants (CW, October 26) has prompted one reader to write at length, challenging some of the assumptions made, and raising a number of related issues.

One of the questions posed by S.F. Halse, of Richmond, Surrey, is whether the assertion of invariance is really the best approach.

"Should one specify invariants?" Halse writes. "Surely all memory which *may vary* should be specified, and all other memory assumed invariant by default."

Of course, some operating systems already provide a limited degree of protection in this area, by segmenting user programs into pure code and data sections. Erroneous attempts to overwrite code, for example by overrunning table limits, can thus be trapped automatically.

Much more specific protection is offered by modern language security features such as scope checking and array subscript checking. These compile-time or run-time tests can go a long way to ensuring that variables are not handled illegally.

But mechanisms which prohibit write-access to out-of-scope data — in effect defining Halse's "memory which may vary" — constitute only the negative aspect of program proving: that is, demonstrating what a routine does *not* do.

In contrast, the whole thrust of the use of invariants is towards proving what a routine *does* do.

Halse later echoes this notion while discussing the use of assertion.

"Mathematical checks," he suggests, "could include relating the change in an input value to that in the output value. For example, in some cases, a parallel monotonic increase in both values over a certain range."

This is exactly the type of assertion envisaged by those who advocate the assertional technique. It is, in fact, most often an invariant *relationship* between variables that is asserted, rather than the invariance of particular items.

Languages such as Euclid (Software File, August 10) make major use of assertion and assertional techniques are likely to play a major part in future language developments. Programmer Notes would welcome further contributions throwing some light on this currently little-known technology.

'Deposit program source material with a third party' — CSA guidelines

SOFTWARE product suppliers should be prepared to deposit program source material with a third party such as the purchaser's bank. And a clause requiring the supplier not only to deposit but also to update this version is an important component of a software licensing contract.

This is one of the points made by the Computing Services Association in its newly-published guidelines for software product licences (CW, October 26).

Designed primarily to protect the licensee from the financial failure of the supplier, the measure is also a safeguard against the failure to provide maintenance at reasonable charges, notes the CSA.

Contractual rights should also be secured when software is actually supplied in source form, recommends the CSA. In particular, the licensee must be able to continue using the software notwithstanding any rights the receiver or liquidator might have in the event of the supplier's liquidation.

The CSA guidelines consist in the most part of a concise checklist of contractual aspects and in general provide no surprises.

In the guidelines for systems development and programming contracts, the CSA is at pains to distinguish clearly between fixed-price and man-time contracts, and its list of standard conditions for each points to most of the danger areas.

It warns, for example, of the need to identify in advance the circumstances in which a fixed price can be increased, mentioning such cases as late hardware commissioning, restrictions on working hours, and shortcomings in third party software.

Fixed price contracts, it says, may well be offered for the system implementation phase. By contrast, the first development phase — functional specification — will normally be conducted on a man-time basis, as the scope and nature of the proposed system is unknown.

In arranging a man-time contract, particular attention should be paid to areas such the basis for charging, including the charging of expenses, assignment of alternative staff, increases in the charge rate, and the minimum period of notice on either side.

First fruits of SPL research centre

CUSTOMISED real-time derivatives of Pascal, ultra high-level application-specific languages, and operating systems for multi-microprocessor systems are likely to be among the first fruits of the SPL Research Centre at Abingdon, near Oxford.

Formally opened last week, the new centre is to create and sell systems software in addition to conducting research and development for clients and other SPL divisions.

David Rodway, managing director of the research centre, said at the opening, "We shall be concerning ourselves with the ways in which complex computer systems are designed and built, and shall be looking into, and developing, tools and methods that enable advanced systems to be implemented more quickly and efficiently."

The division would also be pursuing original ideas in a number of related fields, he said — for example system performance prediction.

The company used the occasion to reveal selected details of an RTL/2-based development already under way at the new centre for "a major manufacturer of defence systems". This involved the "design and implementation of state-of-the-art software tools for a family of PDP-11-like computers designed to withstand hostile environments."

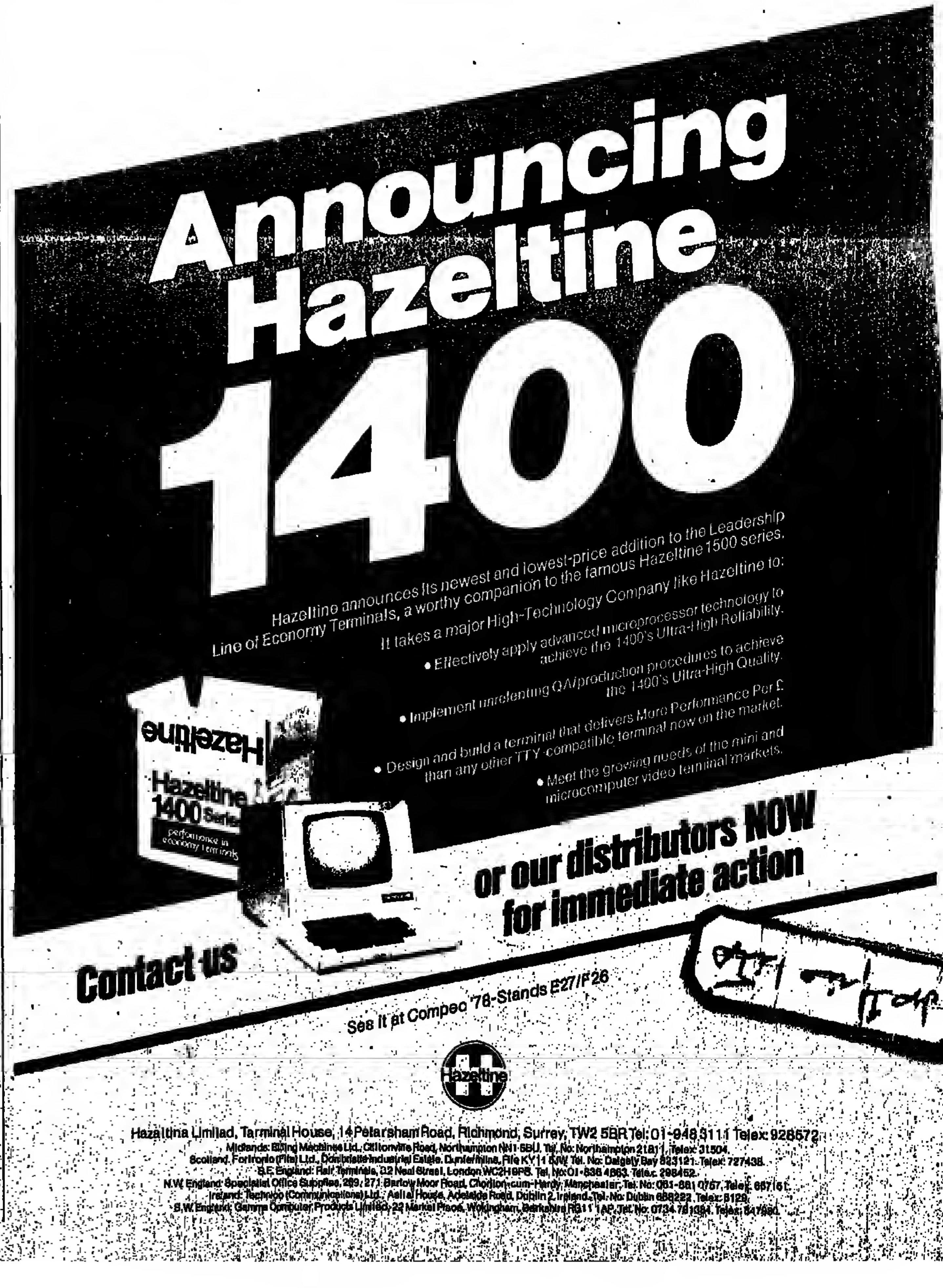
Aimed mainly at inexperienced end-users

● From Page 6

common data item, in this case, EMPLOYEE-NO.

With pro forma tables corresponding to each file displayed on the screen, the user first enters the independent selection criteria specific to each. In this case, >£5,000 under the SALARY heading in the employee file and >10 under the ABSENCES column in the employee history file.

The files are linked by entering the same employee number example under the EMPLOYEE-NO heading of each table. This indicates to the system that the same employee must satisfy both selection criteria.



GUEST OP SPOT

By Ron Linton

Why operations staff should be given proper documentation

AT many inetallations ths matter of opsrstione documentation is given ecent sttantion snd this can lesd to dissetrous results. When srrora do occur it is the operatore, almoet inevitably, who tske most of the bleme. In this erticle Ron Linton, who ia computer operations controller et Msnchestsr Polytechnic, outlines the type end level of informetion needed by operetions steff if they ere to run work efficiently and deel with eny problems which might eriee.

"Will you run this job, please?"

"What do I do with it?"

"Just load and go program 'ABCD, and do a dump if it fails."

"What paper do you want?"

"Oh, plain will do."

OWN up! How many programmers have submitted — and how many operators have accepted — jobs like this? We all have at some time, but doesn't it sound dreadful?

So what is missing? Simply this: **DOCUMENTATION;** the essential information which describes a job and its requirements.

The conversation above provided some information, but what will happen to the job if the operator concerned is not around at run time? Will it run successfully; won't it run successfully; or won't it run at all, because the shift leader will heave it in the litter bin?

The shift leader would be justified, for one can never be certain of a job's requirements; even a regular job may change sometime.

Suppose a program is being developed to update a Customer File, the tests being run on a dummy file; the great day comes when it can be recompiled to use the "live" one. However, not only is it using a dummy file, it is being handled by the two dummies in the conversation at the start of this article.

"Run this job, but don't load the live Customer file!"

"OK, I'll do it after lunch."

But someone assumes that it is still under test, and runs it. Now, what can go wrong, will. So of course the "live" file happens to be online! The recompiled job uses the "live" filename so: No live Customer File; no operator; and no programmer.

All this for want of a written instruction.

So what information is needed by the Operator? This will vary slightly according to the job and the installation, but the following will always be necessary:

- The Operating System to be used?
- The discs and tapes needed?
- The hard output to be produced?
- How long will it run?
- How much store is needed?
- Events that may occur, and what action is required?

Items 1-3 may be implicit, eg if you've got no tape decks, you needn't list tape requirements!

Most simple one-program jobs can be run with the above details, although it may be expedient for the operators to know if a live file is being used. All that is needed is a slip of paper or a printed card with the information on it (see Op Spot, May 18 and June 15).

Linked tests of several programs, however, can be complicated by changes of discs and tapes, and varying store requirements, which make it difficult to schedule parallel work. A simple way of presenting this information is a loading list, indicating each program's requirements in order. Figure 1; this list also clarifies the transfer of tapes between programs.

With this list, the Operator can set up jobs using similar discs to run consecutively, or to be multi-programmed if they are compatible. At run-time, discs and tapes can be loaded in advance if transports are not needed (always assuming that the first program doesn't fail!).

Production jobs for which operations is responsible present a more complex problem, as operations needs to know all about them in order to cope with any irregularities, and to prevent interference with associated jobs. Many programmers will dispute this need, so let us illustrate:

It is three o'clock in the morning and an urgent job is using a disc and writing to a tape; the tape fails.

"Dear dear!" says the Operator (or words to that effect). "I shall have to restart this job."

But suppose that the program was, say, increasing your company's prices on disc by 10%.

Ron Linton

After the restart the first records will be altered by a total of 21%! The customers have hysterics and go somewhere cheaper; the sales director boots the DPM; the DPM boots the operator; the operator looks hurt and says, "Nobody told me!"

If this hasn't convinced you, then probably you think that they should not have used their initiative but referred the incident to the programmer. However, operations cannot run effectively if reference must be made outside whenever something happens. (Could a driver complete a journey if he had to keep calling on his driving instructor for help at every hazard?)

Remember, this job was run at 3:00am and was urgent; would you have enjoyed being called in at this time?

The instructions for that job should have stated: "If program fails, reload Price File from security copy." Operations may be able to muddle through without information, but could never work efficiently.

One could learn to drive without knowing how a gearbox works, but could a racing driver achieve his performance without a thorough understanding of his car?

In order to look after a suite, including security, recovery, and requests for extracts and reprints, Operations needs the following information:

- A brief outline of the suite's purpose.
- When is it to run, and on what initiative.
- Its interaction with other suites (eg Invoicing may produce Sales Ledger data).
- Flowcharts of all programs and file usage, showing their inter-relationships.

At program level, the details listed earlier are necessary, plus, briefly, what the program does. The section on "events" should define what the operator is to do in response to each event, even if it is only "Refer to programmer." There must be some circumstances, such as program failure, which operations cannot resolve, but they must know what they can and cannot do.

The most effective way of presenting this information is, probably, to have a manual for each suite, and to keep these manuals in the Job Assembly area.

Their contents should be as follows:

- Loading list for the suite, or for each contiguous section (which can be referred to while the program is running).
- Brief outline of the suite's function, any variations to consider, (eg the difference between "daily" and "month-end" runs) and how the job is initiated.
- Flowchart of programs/files.
- Details of each program, as described earlier.

Where an operating system is used, one might think that much of this information becomes unnecessary. This is true, under routine circumstances; good documentation is essential to cope with the unexpected.

The way in which the OS runs a job may give rise to situations which affect the operators; for instance it may perform automatic security dumps at intervals, which the operator would like to know about!

Each manual of instructions should include a section on the effect of the operating system, listing which programs are run by which macros, what messages are produced, and indicating where date cards must be inserted. Normally only this section and the loading list will be needed, the rest being invaluable after the disaster!

Apart from job documentation, the operators need details of the installations software — the Executive Supervisor program, and the operating system itself (which is just another program in this context).

And what about utility programs which the operator is often expected to run without outside instructions? Is there any write-up on the hardware?

This kind of information is often overlooked by people inside! No-one would expect a programmer to work without his manual, but many installations fail to realise that operators have similar needs; the console should have a manual on this kind of information.

Where the operating system generated to suit the application, details of the options and disc cartridges used are essential.

There is one other topic sometimes not even thought of: operations department contingency documenting – procedures. When are security copies made; systems discs taken? How are these be recovered? When is it to be done about remote terminals; the mainframe should run?

Such procedures are usually passed on by word of mouth, and a pack of cards that I remember the army used to call mumbled "Set enforcements" and the legend, was sent there in pencil.

We are all, I'm sure, guilty of such an omission at times, but it's not really good enough; write up these procedures, recovery could be a matter of record copies of the relevant programs and parameters.

Well, do you think your installation is properly documented? Try this test – hand an operator from outside your installation him in the machine room with your manuals, and see how he gets on!

PROGRAM LOADING LIST

Program	Disc	Disc	Disc	MT	MT	MT	Store	Run time
ABCD	1	12		Work	267		12K	2
WXYZ		12		↓	Work		18K	4
EFGH		12	17		↓		32K	20
LMNU		12		↓			17K	5

Figure 1. The program loading list provides a simple way of indicating the requirements of each program in order.

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A page in two minutes

DOUBLE the speed of previous machines is claimed for this new model of facsimile transceiver announced by 3M. An A4 page can be transmitted over dial-up telephone lines in two minutes, compared with the usual four minutes.

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The Model 2348, as it is called, sells for about £1,400 or rents for about £50 a month, according to the size of the order.

Digico agent's Turkish bureau

INTENDING purchasers of Digico minicomputers in Turkey can develop their software using the bureau service offered by Digico's Turkish distributor, Plastronik. The service is based on a 192K Digico *MTS/16E minicomputer* with 11.2 Mbytes of disc store. One of its customers has used it in the design and development of a Turkish car.

Insurance broker's package for ICL 1500

PIONEERING the use of the ICL 1500 as the basis of n hardware-software package, Beaufort Computer Services, of Gloucester, has placed an OEM order for ten 1500s, and intends to offer them with a suite of application programs for insurance brokers. The bureau also intends to replace its ICL 1902T with a 2960 early next year.

"We have developed system software, in particular a disc handling routine, for the 1500, and we are writing the insurance brokers' package in the assembler," Beaufort managing director Derek Tolman told Computer Weekly.

He sees the new ICL 1505 version as particularly attractive when multiple terminals are required to acccess the same disc backing files under the control of a central 1500.

The new 2960, valued at about £800,000, will initially run under DME 1900, taking over the workload from the 1902T. "We considered the new DME+, but it is more expensive than DME 1900 and we did not really need the extra power it provides," said Tolman.

As regards a native mode operating system, Beaufort has not yet decided between B and K.

"We are leaning towards VME/B, but the final decision will rest on what the extra running cost of B turns out to be."

The terminals attached to the 1902T, nine so far, soon to be increased to 20, will be transferred to the 2960, which is due for delivery in the first week of February.

"We would have liked the machine sooner, but we are not sorry now that we waited, because it means we will get a 2960 with 16K memory chips," said Tolman.

The bureau has built up particular expertise in the insurance field, serving clients in the West Country, and has increased turnover 500% since moving from London some four years ago.

Starting with its regional clients, it plans to expand marketing of the 1500-based system to cover the whole country.

Slowdown of order rates forecast in US recession

A RECESSION in the United States next year is now forecast by most economic commentators, but the consensus among analysts concentrating on the computer industry is that the major manufacturers will suffer little, although some of the small plug-compatible vendors may be hard hit.

A report from New York stockbrokers Bache Halsey Stuart Shields Inc is timely in that, although published on September 14, before all the measures announced by President Carter to combat inflation, it studies the likely effect of recession next year on the five major US general purpose mainframers.

Order rates are expected to slow from the phenomenal level reported by all the companies over the past year, and IBM announcements such as the 8100 and System 38, both of which have been greeted with a tidal wave of bookings in both Europe and the US, are likely to cause some temporary uncertainty in the market as users try to evaluate them. The IBM E-series, when it finally appears, is likely to have a similar unsettling effect.

Of the companies, IBM looks to Bache Halsey the least likely to be hit by the recession, and only Honeywell comes in for any note of real caution.

The summary on IBM is that with a backlog of orders exceeding the previous record by 85%, and 3030 series deliveries gathering pace over the period, profit growth should be well above average.

"New" products by Burroughs in the first half, identified by Bache Halsey's William Beeklean as in the main reconfigurations and repricings of existing products with the widespread addition of 16K memory chips, should help the second most profitable large US mainframer to continued strong growth in profits, turnover and orders.

On Honeywell, Beeklean says: "Honeywell continues to surpass our quarterly earnings expectations, and much of the strength is coming from the computer operations, with both revenues and margins improving."

But he concluded: "We continue to be concerned over the long-term future of Honeywell's computer business. However, it now appears that, in the short run, HIS can participate in the current strong demand and demonstrate good earnings gains from its computer operations."

Enthusiasm about strongly rising profits at NCR is tempered by fluctuating order levels, but overall, Beeklean is optimistic.

"Lower manufacturing costs have already contributed to strong profit gains in the first half of 1978. If order rates remain strong, 1979 should be a good year for turnover and profit," he says.

He also expects some of the $280 million cash received from BAT for its Appleton Papers division to be spent on acquisitions in the computer area.

Everything at Sperry Rand looks good to Beeklean, and his feelings are backed up by an announcement from Univac that orders for the formidably successful 1100/80 large-scale mainframe have now surpassed $550 million, with 50% of orders from outside the US, which is a greater proportion than Univac's business as a whole.

Overall, Beeklean sees the overseas business of the mainframers as a stabilising influence on performance, since the US recession is not expected to be reflected immediately in the rest of the world.

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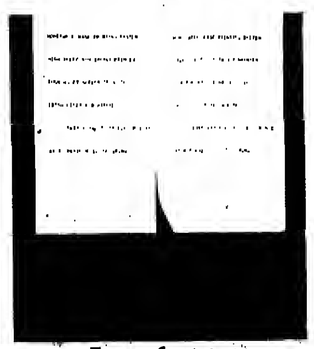
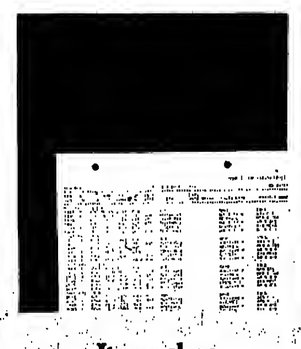
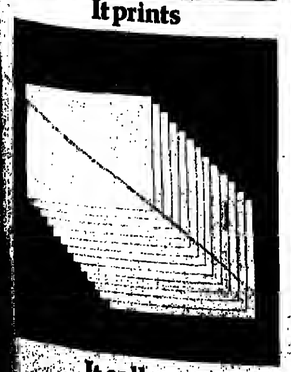


It perforates



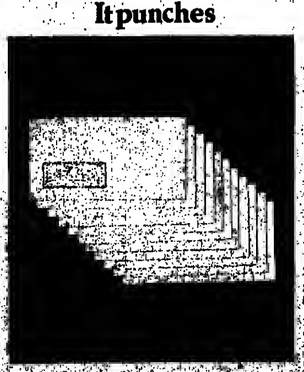
It punches

It cuts



It collates

It stacks



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PEOPLE AND EVENTS

Edited by Nancy Pocock

Appointments at Digital Equipment

SEVERAL appointments have been made in marketing at Digital Equipment. Edger Valentine joins the company from GEC Semiconductors where he was a product manager. At Digital he will be marketing manager for the components group, responsible for the marketing aspects of terminals and microcomputers.

The newly-created position of European marketing manager for the traditional product line is taken by Geoffrey Finch.

He forms part of a new European marketing organisation, based at Reading, and is replaced as OEM marketing manager by Don Tobmoush, latterly North American marketing manager for the DEC OEM products group in Maynard, Massachusetts.

UK marketing manager for the laboratory data products group is Dick Wright, previously based in the States as LOP marketing manager and sales manager.

Formerly a senior sales engineer in the laboratory OP group, Brian King has been made UK government and major accounts programme manager.

King

Valentine

Martin Mkeball at British Gas HQ has been appointed head of computing services. His previous position was that of chief accountant, administration.

Gyan Jain, who obtained his doctorate in computer engineering at London University, has been appointed vice-president of system engineering with Documation in Florida. His previous job was director of systems engineering with Datapoint in San Antonio.

Mick Dungworth has left ICL, where he was regional support manager of the national research region, to join Cray Research UK as technical support manager.

Ahmed Saad, manager of the Polytechnic of the South Bank computer centre, has been awarded a PhD in computer science from London University for a thesis on the design philosophy of operating systems.

Cathcart

Rutter

Ivan Rutter and Jack Iddon have joined Texas Instruments' European digital systems division as senior field sales engineers. Both were previously with General Automation, Rutter is based at Slough and Iddon at Manchester.

Appointed field sales engineers with TI are James Cathcart, who previously held a similar position with Teleprinter Equipment, and Bill King, from Datec.

Rhys Jones has joined Jenson Computer Systems as software manager. Previously he was a project manager with Data Logic.

William Lowe, previously a senior consultant with CMG, has become director of consultancy services with Lonsdale Systems.

John Cookson has been appointed sales engineer for Scotland and the North of England with Calcomp. Previously he was with Compeda, selling CAD software products.

Scotchmer

Melsom

Mick Scotchmer of CMG (City of London) has been promoted from project leader to associate director.

Doug Ash has been appointed sales manager of Data Design Techniques. He was previously a sales engineer for Penny and Giles Data Recorders. Jenni Melsom has become a sales administrator in DOT's sales department.

Nick Pollard, a UK salesman with CPP, has been made UK manager, and Cliff Smith, a senior salesman, assumes responsibility for international sales co-ordination as well as for the introduction of new products. Chris Finch and Dave Chamberlain have joined CPP as salesmen. Finch was formerly a salesman with ICL, and Chamberlain was in teleprocessing with Air Products.

Jimmy Aldous, previously account manager with Olivetti's integrated data systems division, has joined Optical Business Machines as a sales executive.

Calls for papers

PAPERS are solicited for the Conference on the Production and Assessment of Numerical Software NS78, which will take place on April 9-11, 1978 at Liverpool University.

Topics to be covered include: tools to aid production of numerical software; portability and transportability; numerical design of large packages; testing for performance, reliability, correctness; language design, documentation.

Complete copies of papers, which should not exceed ten pages, should be sent by December 14 to the Programme Chairman, M. A. Hennell (NS78), CSS Department, University of Liverpool, Liverpool L69 3BX, tel: 051-709 6022, from whom further details of the conference can also be obtained.

PAPERS are invited on any aspect of information retrieval for the research colloquium of the British Computer Society Information Retrieval Specialist Group, to be held on April 2-3, 1979 at the University of Aston in Birmingham. Synopses (to Professor Keith Rip R. N. Oddy at the Information Retrieval Research Centre, University of Aston in Birmingham, 15 Cathedral Road, Birmingham B4 7PA, by January 15, 1979. Further details can also be obtained from Dr Oddy, whose telephone number is 021-359 3611.

DIARY

NOVEMBER 27

The use of Mumps in the National Health Service, seminar. BCS Medical (London) Group. London School of Hygiene & Tropical Medicine, London WC1. Apply before November 20. Mrs Gunrip, tel: Brentwood 228470 ext 27 or 49.

Specification and use of high performance analogue/digital converters, colloquium. IEE. Savoy Place, London WC2. 10.30. Register with IEE. 01-240 1871.

Recent developments in controllers for process control, colloquium. IEE. Savoy Place, London WC2. 10.30. Register with IEE. 01-240 1871.

NOVEMBER 27-29

CAD of digital electronic circuits and systems, symposium. EEC Commission. Hilton Hotel, Brussels, Belgium.

NOVEMBER 28

Computers in engineering. Charles Lang, William Elliott, Ken Robinson. Institution of Mechanical Engineers. IMechE, 1 Birdcage Walk, London SW1. 14.00.

Computers and education in the 1980s. Dr William Tagg. BCS/ACM Chapter. BCS HQ, London. 18.30.

The key-to-disc industry. Neville Braine. Institute of Data Processing Management. Inforex, Headstone Road, Harrow, Middx. 19.45.

Designing with microprocessors. P. Watkins. IERE E Anglian section. Cossor Electronics, Elizebeth Wey, Harlow, Essex. 18.00.

The role of large computers in the future. Prof Frank Sumner. BCS S Essex branch. West Cliff Hotel, Westcliff-on-Sea. 19.45.

NOVEMBER 29

New technology and its effect on CIM — laser printers and distributed processing. BCS Microform Group. NCR, 206 Marylebone Road, London NW1. 16.30.

Graph theory and network flow for effective bounds. Ms A. Hey. BCS Mathematical Programming Study Group. London School of Economics, London WC2. 18.30.

The next ten years. Hedley Vaysey-Univac Series 90 Users' Association. Royal Horseguards Hotel, London SW1.

NOVEMBER 30

Debate. BCS, PLA Group/APL Group. London School of Economics, London WC1. 17.30.

Getting into computing, for the distributive trades, seminar. NCC/ Computing Services Association. Grand Hotel, Birmingham. Bookings, tel: 021-236 6333.

DECEMBER 1

Fortran Forum 78. BCS Postgraduate Sheffield Bldg, Imperial College, London SW7.

Language and artificial intelligence. J. Cohen. Computation Laboratory, University of Oxford. Dept of Experimental Psychology, South Parks Road. 17.00. Details Mrs S. M. Hacker tel: 56721.

DECEMBER 4

Office computing. BCS Hampshire branch. Electra House, Cobham.

DECEMBER 4-8

Data manager. European Academy for Management. European Commission Conference Hotel Norge, Hamburg, Germany.

DECEMBER 7

Philosophy of mathematics and computer/artificial intelligence. colloquium. Royal Institution, London W1 (£1 donation necessary, call 01-493 8161).

Computers, the next 25 years. Dr Christopher Evans. BCS NW London branch. Master Robert Hotel, Greenford, Middx. 19.30.

Personal computing. BCS Harlow sub-branch. Sawbridgeworth, Herts. 19.30.

Social implications of microelectronics. computers into small companies. Dr Barrow. BCS Leicester branch. Polytechnic, Went Bldg, Leicester Polytechnic.

Computer art. Bob Lansdale. BCS Birmingham branch. Birmingham Polytechnic, Edgbaston, Birmingham.

Computer typesetting. Peter Dews. BCS N Staffs branch. Crest Hotel, Stoke-on-Trent, 20.00.

Virtual machine architecture and modern operating systems. Peter Denning. BCS Newcastle-on-Tyne branch. Computing Laboratory, Claremont Bridge Bldg, Newcastle-on-Tyne, 19.30.

DECEMBER 5-7

Compex exhibition. Compex Ltd, Olympia, London.

DECEMBER 6

Computers, the human resource. The Industrial Society, WC1. 9.15. Details Miss Sexton ext 200.

Microprocessors in medicine. IEE. Savoy Place, London WC2. 10.30. Register with Sue Hall (LSDHA).

Current of general interest studies in engineering. Colloquium. IEE/IEETE. Savoy Place, London WC2. 17.00.

The development of software for large scale integrated circuits. meeting. H. L. Peace. IEE/RAeS. Savoy Place, London WC2. 17.30.

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Cray 1 offered on bureau basis in UK

THE power of the Cray 1 supercomputer will be available on a bureau basis in the UK from December 1 via London United Computing Systems, LUCS, the UK subsidiary of United Computing Systems of Kansas City, Missouri. Clients will be able to run large scale Fortran IV programs on the system.

The Cray 1 was ordered by UCS last year (CW, September 28, 1977), and has now been installed at Kansas City where it can be accessed from most parts of the US and Western Europe via Uninet, the UCS network that also embraces the LUCS data centre in London and Fides Computer Centre in Zurich. Fides, a subsidiary of Credit Suisse, signed a joint marketing and network utilisation agreement with UCS early this year.

The Cray 1 provides 80 million instructions per second of processing power, compared with a total of 35 mips provided by all the other machines at Kansas City — two CDC Cyber 175s, three CDC 6600s, one Cyber 174 and two 6400s.

Most of the Cray 1 users are expected to be those with very large DP tasks to perform, like dynamic finite element structural analyses using the Nastran suite, a facility that should be of interest to the oil rig construction industry.

The Cray 1 will also be available to clients with Fortran IV programs that are too large for "conventional" computers, and other potential users include would-be Cray 1 purchasers wanting some experience with the machine before they install their own.

Offering Cray 1 services in Europe is part of UCS' efforts to expand its business on this side of the Atlantic. Its European marketing is now being directed by United Computing International, a division with its head office in London at United House in the City, which is also the new premises of LUCS. The latter runs one CDC 6500 there and is about to install a second.

The line-up of mainframe hardware at Fides in Zurich comprises one CDC 6500, one Cyber 170 and a Univac 1100/80.

Apart from expanding geographically, UCS extended its range of services earlier this year by acquiring Calmo of Sunnyvale, California, which is described as a leading supplier of turnkey systems for printed and integrated circuit design, mechanical design, drafting and mapping. Calma now has its European headquarters at United House in London.

Business Show dates

THE second International Business Show, now established as a biennial event, will be held from October 23 to November 1, 1979 at the National Exhibition Centre, Birmingham. It promises to be considerably bigger than the 1977 IBS.

Several computer firms are among the 260 exhibitors so far signed up. They include ICL, Honeywell, Sperry Univac and GEC Computers. This is in contrast to the last IBS at which only ICL of the "mainstream" manufacturers was represented.

Viewdata in US

IN the opening paragraph of our report on viewdata services in the US, it was incorrectly stated that Insac markets the Post Office Prestel service in the UK. As was clear from the remainder of the article, Insac markets Prestel in the US, and not in the UK.

THERE'S MORE TO LUTON THAN CAMPARI AND THE AIRPORT

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The ancient art of vulture stuffing

VULTURE stuffing is one of the lesser known areas of expertise within ICL, but David Reeves, a personnel manager with ICL at Putney, is sufficiently knowledgeable about the ancient art of taxidermy that he was able to estimate accurately how long it took to stuff the vulture looming over his head at the top of our picture.

Reeves guessed that the stuffing time was 18 hours and he is seen (left) being presented with a prize — a weekend in Paris for two — by Lawrence Alexander, sales manager of Grand Metropolitan Hotels, whose subsidiary, Bateman Catering, ran the guess-how-long-it-took-to-stuff-the-vulture competition at the Institute of Personnel Managers conference at Harrogate.

Reeves' accurate estimate of the stuffing time is made all the more impressive by the fact that the vulture was stuffed 100 years ago, and Bateman Catering had to bring in an expert taxidermist before the competition to advise them on how long it would have taken.

All of which goes to show that the ancient art of stuffing birds is not lost forever.

Cadbury Schweppes uses OCR for remote online data entry

REMOTE online data entry using OCR instead of keyboards is being implemented by Cadbury-Schweppes at its depots all over the country. Two depots already have OCR equipment reading sales data handprinted on order forms by salesmen in the field.

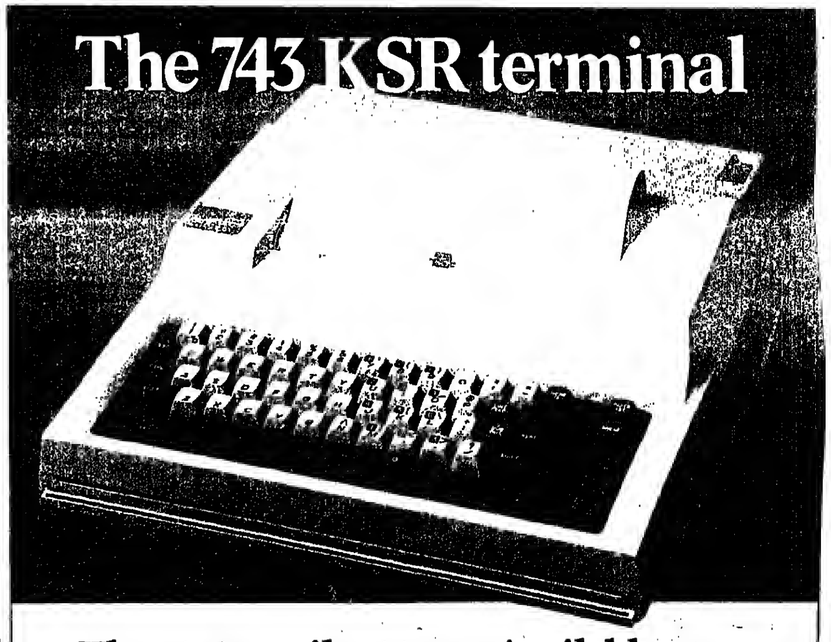
The OCR kit being used by Cadbury is the System 70, which is built in the US by the Cognitronics Corp of Stamford, Connecticut, and sold here by Cognitronics Ltd of Worksop, Notts, an independent firm which has adopted the same name as the US company.

The System 70 configuration costs about £50,000 and includes a laser beam scanner and a VDU for displaying images of rejected characters so they can be inspected and re-entered by the human operator.

System 70 can read OCR A and OCR B upper and lower case as well as numeric handprint.

At each Cadbury depot the System 70 is interfaced with a Harris 8170 intelligent terminal system linked online in IBM 3270 compatible mode to Cadbury's IBM 370 mainframe system at its Bournville headquarters. The display terminals on the 8170 are used for interacting with Bournville while the System 70 handles order data entry.

The 743 KSR terminal



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Full information available from: Texas Instruments Ltd., European Digital Systems Division, Data Terminal Marketing, MS33A, Manton Lane, Bedford MK41 7PA. Tel: 0234 67466 Telex: 82178 Stockport: Tel: 061 442 8448 Slough: Tel: 0753 35545

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How accurate are manufacturers in the way they describe their products? Do their claims, as expressed in brochures, advertisements and similar publicity, stand up to close scrutiny? The recent BCS survey of user requirements (CW, November 2), was highly critical of some of the promises made by manufacturers to users. In this article Nicholas Enticknap takes an in-depth look at the way one potential user responded to the announcement by Digital Equipment of its VAX system.

Digital Equipment's VAX 11/780 system

Can you believe all you read in brochures?

By Nicholas Enticknap

IN the course of carrying out a detailed survey of minicomputers to find a system to be used in its conception of "dispersed data processing," the Scandinavian Airline System found considerable discrepancy between Digital Equipment's claims for its VAX-11/780 and reality.

A report on the SAS findings has been produced by Henry Norman, a systems programmer working on the project, and he is severely critical of the way in which DEC has presented the product.

Norman takes DEC particularly to task on two important qualities of the VAX; its billing as a 32-bit machine, and its claimed compatibility with the PDP-11 family. The report gives detailed arguments in support of his views.

He is quick to stress, however, that he is not attacking the VAX-11/780, only the way it has been promoted. He adds that "it is probably the best 16-bit (sic) computer for large Fortran applications that the industry has ever produced."

Henry Norman sent a copy of his report to DEC in August. At the time he contacted us, in October, he had not even received an acknowledgement, far less a reply. DEC, however, has told us that a high level reply is being prepared at its headquarters in Maynard, Massachusetts.

As the points raised by Norman are of considerable interest, not only to potential VAX users, it is worth considering them in some detail. First, the 32-bit appellation, which Norman describes disparagingly as a "myth."

He argues that the description

'Compatibility is rarely absolute; and never so between one machine and another of fundamentally different architecture. It is therefore a question of relative compatibility.'

"32-bit" ought to apply to the word length one quintes the VAX architecture handbook as stating specifically that the word length is 16 bits. So why does DEC call the VAX a 32-bit machine? Norman assumes that this refers to the theoretical address range.

Having said which, he points out that although the data path width is 32 bits, the physical address range is only 30 bits, giving a maximum addressable storage of one Gigabyte (1,024 Megabytes), which is only one quarter that of a 32-bit range.

This size then has to be divided into two, as half this theoretical size is set aside for I/O registers. The maximum physically available size is thus 512K bytes, one-eighth of the 32-bit maximum.

Norman concludes that the VAX is not properly a 16-bit machine. He has in fact got it wrong, but it is a good example of how labels can mislead, and how readers need to be clear about the implications of seemingly straightforward machine characteristics.

The first point to clear up is the question of DEC's own definition. The handbook does indeed define the word length as 16 bits, but this is a semantic rather than an architectural definition.

For DEC, a word is equal to 16 bits, whatever machine is being referred to. A unit of 32 bits is defined as a double word. Similarly, eight bits is called a byte, and four bits a nibble.

DEC's own justification for describing the VAX as a 32-bit machine is that 32 bits is the maximum number that can be operated upon at any one time in parallel. Thus all data paths throughout the system are 32 bits wide. Another way of defining the same thing is to say that the bit width of a machine is equal to the number of bits you can put in a program counter.

Leaving aside physical considerations, there are two major implications of a bit width. First, it defines the accuracy of computation. The ability to operate on 32 bits in parallel gives a much higher degree of precision in complex computations.

Secondly, it constrains the maximum physically addressable program size. In basic form, a 16-bit machine can only address an area of 2^{16} words, which is 32K. With 16-bit systems which have some kind of memory management system, such as the PDP-11/34, the maximum attachable memory is 128K words, but the maximum individual program size is still restricted to 32K words.

With a 32-bit machine, the maximum theoretically addressable memory becomes 2^{32} words, which works out as four Gigobytes. As Norman points out, in the case of the VAX this is reduced for various reasons to 512K bytes. As, however, the maximum available memory is only eight Megabytes, this constraint is irrelevant. In any case, try imagining a single 512K byte program!

Bearing all this in mind, DEC is entitled to call the VAX a 32-bit machine, indeed more so than some other manufacturers, which have machines with 32-bit data paths but capable of operating on no more than 16 bits in parallel.

On the question of compatibility, Norman is on stronger ground. Compatibility is rarely absolute; and never so between one machine and another of fundamentally different architecture. It is therefore a question of relative compatibility, and each user has to make up his own mind about the problems he will encounter and what they will cost him.

Norman's first point is that all programs depending on services from any operating system other than RSX-11M cannot be transferred. (He assumes, correctly, that the S, D and + variants of this operating system are included.)

Even programs within this category, he adds, are not necessarily safe. He quotes the DEC list of RSX systems directives which are not supported on VAX, describing it as "long" and "by no means complete," and cites examples of a number of types of program which are incompatible, such as user-written I/O drivers and programs which use the PDP-11 floating-point instructions.

DEC readily agrees that RSX-11M is the only operating system emulated on VAX, and that RSTS, RT-11 and Mumps are not. The company says, however, that the majority of potential VAX customers are currently RSX-11M users. For those that are not, DEC offers Bliss-32, which allows the user to write his own operating system.

It also points out that programs written in RT-11 Fortran, RSTS Fortran and RSTS Basic are compatible, except for those which make resource calls on the executive.

The unsupported RSX system directives (there are 13 listed, out of a total of 53) are, says DEC, mainly concerned with the memory management system referred to above. These are not necessary on the VAX because of its 32-bit word length, so the user merely has to delete them.

Nonetheless, one is left with a residue of incompatibility. Furthermore, the company specifically says it is senseless to run Fortran programs in compatibility mode — they should be re-compiled to run under native mode as the performance advantages are so great.

DEC's own experience is that in compatibility mode, VAX has 1.2 times the power of an 11/70, while in native mode it has 11 times the power.

Recompilation is not exactly

'... although the data path width is 32 bits, the physical address range is only 30 bits, giving a maximum addressable storage of one Gigabyte which is only one quarter that of a 32-bit range.'

arduous, but if it's necessary can compatibility really be claimed?

This analysis shows that compatibility operates at several different levels (and we haven't even touched on hardware compatibility). For many VAX customers, conversion will be a minor problem, but for some it will require careful reorganisation.

A superficial judgment on these arguments might be to call it one-all, and leave it at that. But the report is not merely evidence of a difference of opinion between a supplier and a customer; it calls the whole nature of manufacturer-prospect communications into question.

The bit-width, which one might think was a matter of straightforward fact, turns out to be a matter of interpretation so much so that it is possible to arrive at a wrong conclusion.

The question of compatibility, which one would expect to be relative, turns out to need careful evaluation before the extent can be measured for one installation.

The point here is that every technical term used to define a computer's capability or performance has an ambiguous meaning. It follows that a product description in a brochure, or an advertisement can only provide a very vague picture — it should be enough to allow judgment on whether the machine is of potential use or not, but a report will not be enough to give a definitive idea of exactly what it will do and how it will do it. The Press can only give a limited service, though if a journal has sound editorial standards each individual technical term will always be used the same way and its reports will as a result be more meaningful.

It also, obviously, has a different standpoint, and rather than to serve its readers' interests rather than to promote a particular manufacturer's product.

However, the value of what the Press says depends heavily on how the reader interprets it. And this applies also to technical literature such as handbooks and specifications, as Norman's experience shows. One would imagine that technical descriptions were quite unequivocal, but this article demonstrates that that is not so.

To get a clear idea of a machine's capacity, therefore, the user must not restrict himself to written sources alone. Even when all of these are taken into account he can still be misled. Discussions with the manufacturer are an essential part of any evaluation exercise.

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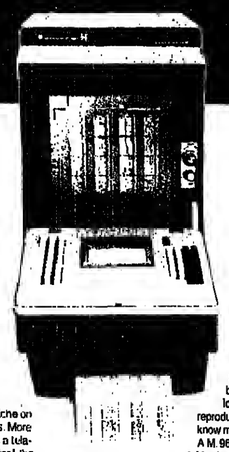

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Texas' portable bubble memory terminal aimed at newsmen

NEWSPAPERS represent one of the most important groups of potential customers in the UK for the Model 765 portable bubble memory terminal, according to Texas Instruments, the firm that builds and sells it.

TI points out that the 765 is particularly suited to use by newspaper reporters at remote locations, like sports events, because its bubble memory — up to 80K bytes — provides a means of storing and editing text that is more reliable and faster than magnetic tape cassette and which, unlike RAM, is completely non-volatile.

Text stored in the bubble memory can be transmitted to the newspaper office using the terminal's acoustic coupler linked up to a normal telephone handset.

TI says that more than a dozen newspapers in the US already use the 765, and that in some cases text is transmitted online to the newspaper's computer system. Otherwise the story can be printed out by a receive only terminal at the newspaper office and sub-edited and typeset in the conventional manner. Union attitudes mean that the latter method will almost certainly have to be used universally in the UK, according to TI.

The first European newspapers to use the 765 are the Swedish dailies, Expressmen and Dagens Nyheter, Sweden's largest evening and morning papers, respectively.

TI in the UK says that one provincial newspaper is currently using the 765 on a trial basis. The 765 is the latest model in TI's well-known Silent 700 range of 30 cps thermal printer terminals and has just been relaunched in Europe, serious delivery problems having dogged the initial marketing effort (CW, August 10).

Mostek to second source the Intel 8086

FOLLOWING the decision of Zilog to go with AMD as the second source house for the Z-8000 16-bit microprocessor (CW September 7), Mostek has had to look elsewhere for a 16-bit device to complement the Z-80 it makes under licence from Zilog. It has now settled on Intel, and the company is to manufacture and second source the Intel 8086 microprocessor.

Mostek's version will be produced using its Poly 5 MOS process, which is broadly similar to the HMOS process used by Intel to manufacture the 8086. There are differences between the two, however, so Intel will not be supplying Mostek with masks for the device.

One reason given by Paul Mayes, Mostek managing director in the UK, for choosing the 8086 after the selection by Zilog of AMD for the Z8000 is the general similarity between the 8086 and the Z80.

Voice data entry terminal prices cut

AN expanded range of voice data entry terminals with reduced prices is announced by EMI Threshold, of Hayes, Middx. Starting at £5,500 for the basic Threshold 500 processor, the range goes up to £42,000 for the Threshold 5400, a four terminal stand-alone or satellite system with a 5M byte disc, a printer and some applications software for standard reporting functions. The previous starting price was £7,900.

Their terminals use the DEC LSI-11-based Threshold 500 processor with 4K of RAM, and ROM expanded from the previous 4K to 8K to hold an improved recognition program with more space for arrays giving information on the acoustic features that are likely to occur. The new program also uses a dynamic programming algorithm which compensates for variations in timing in the spoken input.

The Threshold 600 is a teletype replacement terminal which has a VDU version and a 16 digit display version. It has a vocabulary range from 64 to 500 words or phrases, and outputs in customed code or an ASCII character string serially through a teletype compatible 20mA current loop or RS232C interface.

A Commodore Pet is linked to the basic 500 unit in the Threshold 650, which sells at £6,000 and has been supplied to a major plastics company.

A potential customer for the lower priced products is systems house Arbat of London which has already been running trials with a Threshold voice data entry device for about 18 months. A spokesman said Arbat was interested in the terminals as alternatives to keyboards and touch screen devices in command and control applications involving non-numeric data entry. The competition with low cost devices such as keyboards meant that the market was likely to be responsive to price reductions.

Performance with numbers was not so good, he said, since voice entry of one digit or a time was slower than keying, whereas letters could be entered as a word or phrase at a time.

CDC and IBM grow in South Africa

From our South African correspondent

WHILE action by UK trade unions and the Anti-Apartheid Movement threatens to hinder ICL's operations in South Africa, according to businessmen in South Africa (CW, November 15), it appears that US computer companies are remaining relatively unscathed by the American government's ban on the shipment of computers there.

Two US companies currently enjoying increased business in South Africa are IBM, which reports increased deliveries, and Control Data, which has formed a new telecommunications software division.

CDC's new South African subsidiary has been set up to market and support expanding demand in the indigenous telecommunications market.

The division will specifically market a software package called Network Communications System that has taken two years to develop locally in South Africa.

"NCS is a self-standing, packet-switching network system that uses the X25 communications protocol," Rahin Piper, manager of the new division, told Computer Weekly. "Already, we are completing a network system for a joint Barclays Bank/Standard Bank project in South Africa, and have sold it overseas to Denmark, Australia, New Zealand and Israel."

NCS is based on CDC Cyber 18 minicomputer hardware and uses CDC 255X network processors as network nodes.

The managing director of IBM South Africa, Jack Clarke, reported this month that the amount of new computing power delivered by his company so far this year is up by a massive 250% on the figure for 1977.

Although declining to divulge details of actual sales figures, Clarke did say that the increase was due to "the astonishing improvement in computer technology" rather than a function of improved sales. Because computers are becoming smaller and less expensive as well as easier to use, they are selling much faster, he explained.

Earlier this year, however, the picture was not so optimistic for US companies, as South African businessmen feared the worst from the Carter Administration's embargo on the export of US computers to South Africa (CW, November 1).

This move created marketing problems for American computer manufacturers and there was a swing away from them to UK and European suppliers.

For ICL this was good news, and during the financial year ended September 30, 1978, it managed to capture a £42 million chunk of the systems market in South Africa, accounting for about 10% of the group's worldwide business for that period.

But the feeling among South African businessmen now is that there could be a re-establishing of the situation in favour of the US companies if trade unions and "groups of political agitators" persist in their attitudes towards South Africa.

Essay contest

THE Institute of Data Processing Management and the consultancy firm Langton Information Systems are jointly sponsoring an essay competition on "The practical implications of distributing computing power."

A first prize of £300 will be awarded, and the winning entries will be published both in Computer Weekly and in a book to be produced by Input Two-Nine. Essays are to be between 2,000 and 3,000 words long, and may cover any areas and aspects of the benefits and problems of distributing computing power.

Further information may be had from the IDPM at 12 Henrietta Street, London WC2E 8NU. The closing date is April 30, 1979.

For viewdata users

THE first issue of Viewdata is and TV User is out now. A quar only magazine, it contains, the official Prestel directory and index to the subjects covered, as well as articles about viewdata and teletext and other gizmos for televisions like TV games and as a home computer output device.

It is sent free to all Prestel users, or by subscription at £2 a year, from Viewdata and TV User (CW), Oakfield House, Perrymount Road, Haywards Heath, Sussex RH16 3DH.

Fibre optics range launched

FIBRE optic products from Lee Green Precision Instruments' subsidiary, Fibre Link, will be distributed in Germany and Austria by Telemeter Electronic of Donauwerth.

The distributor was signed up in time for the Electronica Exhibition in Munich last week, and Fibre Link's range of products was shown for the first time in Germany at the exhibition. The range includes amplifiers, transmitters, receivers, fibre cable and connectors for use in transmission at 5M bps over a 1.5 Km range.

Two weeks earlier there had been an international move in the opposite direction when Suhner Electronics, the UK subsidiary of a Swiss company, launched its range of fibre optic cables and connectors in the UK at the Wembley Military Microwave Exhibition. It showed a range of 20 connectors including one new type with a clamp like a drill chuck. Suhner's cables are based on Pilkington fibres.

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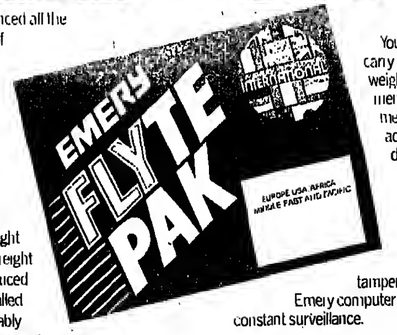

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Changing jobs?.....a guide for salesmen on the move

Revealed at last . . . Alan Williams is Trader

By Alan Williams

As autumn and Compec draw near, many salesman begin a "musical chairs" aeason of job changing. This is a phaanmanon that haa baen closaly obsarvad for many years by Alan Williams, whose parcaptiva commants on the sales acaas have baan appaaring in the Computar Weakly Salas Bit column for ovar a yaar, undar the nama Trader.

Williams is a diractor of SMR Salas and Marketing Recruitars Ltd of Tavistock Placa, London WC1 and a consultant with Salas and Marketing Sarvicas, an association of companias providing markat raaaarch, salas training, promotion and racruitmant sarvicas to the computar industry.

Previously he had wida exporiance working in salas and marketing positiona in the industry and, on tha quastion of job hopping, he obsarvas: "It is probably trua that salasman, baing naturally anthusiastic and optimistic craaturas, ara the easiast paopla to sall to. Thay ara always aagar to saa the banafits and advantagas of a proposition and so it is ralativaly aasy to aall a 'bum' job as tha 'opportunity of a lifatima'."

Williams discusses some of tha fundamantal considarations ha balliavas salasmen should maka to ansura thay ara going in tha right diraction.

THE first and most important consideration the salesman should make when thinking of changing job is whether his present dissatisfaction is necessarily resolved by moving to another company. The reflex action of seeking a new employer without first discussing the situation with a direct superior is a very negative and often destructive act: a salesman with a record of sales success is generally a much valued employee and there are very few situations where an employer is not prepared to bend over backwards to resolve the salesman's grievances.

Revised targets, amended remuneration packages, early promotion, reorganisations, special bonuses, etc are always possible when circumstances demand it.

There are also other considerations to be made in the context of the saleaman's current employment. Has he completed the task he originally agreed to carry out when he joined the company? Does the length of his service suggest that he has allowed sufficient time for such a job to be carried out? Indeed, has his service been long enough for him to know truly his product and his company and be sufficiently well established to be considered in the context of promotion or personal advancement of any kind?

Short terms of service look bad on a curriculum vitae and the general reaction of potential employers is that a brief job span is a function of employer rather than employee dissatisfaction. It is a recurrent phenomenon that the contrary is also true, for in interviews, short-term employment is always justified by candidates in terms of their own disagreement or disenchantment with the company.

Try as one might, a professional recruitment counsellor has no method for revealing absolute truths, and neither has the potential employer, other than the efficient simplicity of independent reference checks. In my own company we have formal tests, interview techniques and the application of extensive sales and marketing experience, but these applied in the context of truth, ethics, industry, common sense, intuitive and trust can at best identify only the tips of icebergs.

It would therefore make life so much easier and career/vocational guidance so much more effective for the individual candidate if his justification for leaving a job prematurely, or even after an acceptable length of service, could be viewed by him from his employer's point of view as well as his own. If he got the sack because he failed where others succeeded, we need to know why.

Armed with such knowledge we can direct him to a company which has the management skills to counter whatever inadequacy caused the failure or alternatively avoid a job where the same factors could generate the same problems all over again.

So, when the salesman in an interview is in the position of having to justify a short span of employment, or indeed any questionable aspect of his career history, then there is no alternative to the truth. Truth will not only make it possible for the recruitment counsellor to do his job more effectively but also ensure respect in the eyes of a potential employer. In circumstances where a salesman might disqualify himself from a potential job by being truthful about his career history, it is probably a job he is best without anyway.

> ***The risk for both employer and employee in the job-change situation is considerable, no matter how attractive the pictures of future harmony and satisfaction painted by both parties might appear.***

Of course, most salesmen who decide to look for another job have achieved their personal objectives with their present employer and have decided, for whatever reason, that their best career opportunities are likely to be found elsewhere. In this situation there are many serious considerations to be made. It has to be appreciated that "You don't know people until you live with them" and therefore the risk for both employer and employee in the job-change situation is considerable, no matter how attractive the pictures of future harmony and satisfaction painted by both parties might appear.

Having decided to seek new pastures, there are some logical considerations for the salesman to make in the context of his future career. Blind aspiration is seldom an effective vehicle for making a progressive career step.

The first stage is for him to analyse the pattern and relative success of his career to date in the context of job function, technical and commercial applications, computer hardware and services, past employers and vocational satisfaction. This is essential in order to identify any shortfall in experience, skills which are already proven, and the type of occupation and company most likely to augment the shortcomings, exploit the known capability and offer the kind of job which will provide the working environment where he is most likely to be happy and therefore successful.

This is not always a simple process, and obviously one where an effective recruitment counsellor is better qualified to make a judgment. However, the salesman should be just as capable of logically evaluating his own career so that at least he knows what kind of job with what kind of company he ought to be seeking. If subsequently the advice of any recruitment counsellor should be at odds with the salesman's own conclusions the likelihood is that someone is trying to "sell" him the wrong job. Having said that, it is true that the onlooker often sees most of the game and an experienced recruitment consultant can sometimes see reasons why an apparently unconventional job change is really the best step to take; but his justification had better be good.

Other factors which must also be considered are the duration of each stage of his experience and the progression of his career to date. Is the job he is considering a logical next step? Does his six months' experience as Bursley and District field sales manager for the Big Brother Computer Company really qualify him for the post of national sales manager for the Rinkydink Smalltime Systems Company? Is the career step within the reach of his proven capability or is he going to fling himself into such a morass of unknowns that he must fail before he even gets around to doing the job he was actually recruited to carry out?

You would be surprised at some of the amazing, even bizarre job changes some salesmen are persuaded to take on, invariably to their ultimate regret. Such mistakes generally fall into two categories: jam tomorrow, and ego trips.

Many of the first category are apparently "getting in on the ground floor" job opportunities. "A US company just setting up in Europe", "A new turnkey systems house with a product heavy enough to conquer the world" — that kind of thing. I'm sure you've heard it all before: "You may only be a salesman at first, but by 1996 you could be branch manager for Orkney and Shetland". Sometimes this type of situation can be exactly the right thing for a salesman, but if it doesn't make sense in the context of logical career progression it is probably best to give the "chance of a lifetime" to someone else.

We are all susceptible to ego boosting job opportunities whether the stimulation comes from the status of the job or the sylvan tongue of the smooth talking headhunter. "Good morning Mr Potential Fee, my name is Burke Hare of Body Snatchers Incorporated. We are looking for a very special and talented person for the most important and stimulating job ever available and after exhaustive analysis of the industry you have been identified as the only man who could possibly do the job". Gets you where you live, doesn't it?

Basically, there are only two answers: "Sorry, but I haven't completed this job yet" or "Okay, it doesn't cost anything to talk, but before I do, give me a broad description of the job and if it fits my own assessment of what I really ought to be doing next, I'll take your invitation further".

Another point about the ego aspect of changing jobs: everybody wants to be a manager; at least almost everybody. It is difficult for a salesman to resist the temptation of moving to a new post which includes that magic word "manager" in the job title. In this circumstance there are several considerations which need to be made: is the company able to give adequate training in the management skills which will be required; why is there no internal candidate able to take on the job? don't they believe in "growing" their people?; what will be the attitude of existing staff?; is it really a management job? will there actually be people to manage or will the job involve only responsibility without authority? Perhaps it's a one man team and the salesman is it.

One final point on the ego angle. Being headhunted is rather a pleasurable experience. After all, it confirms what you always thought anyway — you do a pretty good job and the word has got around. Don't depend on it, that's not necessarily how direct search methods operate. Most companies involved in recruitment are ethical and conscientious people, whichever methods of recruitment they may use for a given job assignment.

However, as in all businesses, there are exceptions. Such deviation is most likely to occur under the guise of "headhunting". In my opinion it is not ethically possible to "headhunt" you into your present job (and also charged your present employer a substantial fee for doing so!) gives you a call and asks you to consider a new job — do yourself and the industry a big favour: tell them to take a running jump, no matter how tempting the job offer might appear to be.

Another career aspect for the salesman to consider is the impression given by his curriculum vitae to date and the effect the new company he is considering will have on the overall pattern of employers.

> ***Any salesman who is not mobile should never be in the job. Lack of mobility means a dramatic reduction in promotional prospects, and more particularly refusal to move to London and the Home Counties at some time, generally means goodbye top job.***

The emotional effect on potential employers of candidates having worked for the right companies in the wrong order can be detrimental and should always be borne in mind. On the other hand the sequence of employers on a c.v. is of far less consequence than the appearance of a blue chip computer company or two somewhere along the line. Mind you, each ratified experience will get little mileage if it is of less than three years in duration per trip. We always ask our candidates to view their next job from the artificial standpoint of a possible subsequent job, looking back in time and asking the simple question, "Did that job really further my career in the context of the things I really want to achieve in my life?" For the next job to be right the answer to that question has to be an unqualified yes — not "maybe" or "it can't do me any harm and I could earn a lot of bread!"

There are two more questions to be asked: "What will be the effect of the 'commission trough' on my income". The process of leaving a company usually means abandoning a portfolio of prospects and starting all over again. This is where the duration of the sales cycle of the new company's product has particular significance. There's no point in a six month maximum guarantee against sales commission if the period between first contact and payment of the bill is typically a year. Be sure to negotiate a guarantee against sales commission which is reasonable in the context of the normal selling cycle.

Relocation is also a consideration not to be underestimated. I do not mean in terms of leaving friends, changing schools, etc. Any salesman who is not prepared should never be in the job. Lack of mobility means a dramatic reduction in promotional prospects, and more particularly refusal to move to London and the Home Counties at some time, generally means goodbye top job.

The main factors to bear in mind are housing and travel costs. Will the increased income from the new job at least offset the extra costs of greater mortgage repayments and the price of commuting?

Sometimes the process of changing a job can be confusing and a source of considerable emotional pressure. This brings me to the final and very important points: Whatever the promises and potential of the prospective job, a salesman must be sure to make that decision which in the long term is to be the best advantage of his family and not to career or company alone. And when he is at the crucial point of "which job?" or "Shall I go or stay?" his best adviser of all is usually his wife or parents. They may know nothing about computers but they know about personal strengths and weaknesses. They always know better than an employer or recruitment consultant what kind of job will bring job satisfaction or alternatively result in a nervous breakdown.

NCR mini speeds RAC rally results

UP-TO-THE-MINUTE results for each stage of the 1978 RAC Rally held this week are being provided by an NCR 8250 minicomputer system sited at the Holiday Inn, Birmingham — the rally's headquarters.

As each car completes a stage, the results — consisting of stage number, car number, time and penalties — are phoned in by rally marshals. These are keyed into the 128K byte system which updates the position table and flashes a leader board via an NCR 796 video terminal in the Press Room, also at the Birmingham.

Full details are dumped on to cassettes which are taken by RAC officials overnight for the offline printing of the different rally controls.

MICRO NEWS — Edited by Martin Banks

The S-100 has become standard for most of the major manufacturers of small computers, microprocessor-based small computers, boards and software. As the major interface between the processor and the outside world of peripherals, memories, terminals, etc, the bus plays a vital role in the composition of micro-based systems. In this article, DR RICHARD STEVENS, discusses how the S-100 has helped to provide low cost small computers with some surprisingly sophisticated capabilities.

Driving the S-100 bus to a micro future

THE S-100 bus system, which has become the nearest thing to a standard for small general purpose micro-based computers, started off life with no such pretensions.

The original bus was designed by Altair around the Intel 8080 chip as a completely parallel row accessed by 100-pin connectors. It is physically similar to Intel's Intellec microprocessor development kit but, historically, has been oriented more towards higher level languages.

Altair's first systems suffered from power supply problems and, before it could correct this, a second firm, Imsai, moved in with its own version. These computers were supplied with Basic and fairly good assembler language systems, including debug facilities.

Other firms moved into the market with variants.

For example, the Poly 88 was designed to use a TV as a video terminal and a normal Philips cassette for mass storage, providing a very cheap system.

In the US, the concept took off immediately, and tens of thousands were sold within two years. In general, they were bought for personal use.

However, because the professional classes in America take much more interest in technical developments, these users included large numbers of doctors, lawyers, etc, who were interested in applying the systems to their practices.

Very quickly, many small US firms started making specialist boards for the bus — real time clocks, A-D boards, memory cards etc. Often these firms were one or two men working part-time from home but applying years of knowledge picked up from working professionally in the computing world.

This probably accounts for the advanced features found on some of the equipment.

Other small businesses produced software of all kinds, languages like Fortran, Extended Basic, Pascal and programs for business work.

There are now about 100 US manufacturers of boards for the S-100 bus. To describe them in detail would be impossible but a small selection of interesting boards includes modems, mains controllers, speech generating boards, speech recognition boards at $199, PROM programmers, image storage cards, disc controllers and (ICL watch out) an 8K byte contents addressable memory board (for $525).

The intense competition has resulted in extremely sophisticated, very cheap boards.

For example, it is possible to obtain, on a single 10 x 5 inch card: two RS 232C serial ports, two parallel ports and 10 timers for less than $185. The baud rate is software programmable up to 76,800.

Memory is also very cheap; 32K bytes of RAM with a 250nS access time costs only $700.

Unfortunately for the UK, very little of this equipment is manufactured here and, for a long time, this has meant that dollar prices in the States are translated directly into pounds. To a large extent this explains the different usages of the systems in the two countries.

In the UK, the systems are almost wholly confined to professional use. Because the average engineer in the US is earning 2.5 times as much as the UK, he probably has 10 times as much spare cash to spend on a computer that costs him only half as much.

Although there are many other bus structures competing successfully for the same market, of which the Apple computer is probably the best known in the UK, none of them has been able to generate such a "band-wagon" effect.

An assiduously spread myth is that there is something "wrong" with the S-100 bus itself. Indeed, there is, from the point of view of non-S-100 manufacturers; it is too popular and does not suffer from the disadvantages of being confined to the restricted products of one manufacturer.

A rather telling point is the number of conversion kits available to enable other systems, such as the Pet or the Tandy Store computer, to accept S-100 boards.

As far as I know, no-one makes a board to go the other way, in over two years using many S-100 boards, I have encountered plenty of problems with the system, but none of these was related to physical problems of the bus.

Obviously the bus is not ideal: it lacks bi-directional lines and the power supply lines are too close together, but the practical problems are negligible.

The 100 pins, which are claimed to be excessive, are highly desirable for flexibility, spare pins being ideal for developing your own hardware to fit in the computer.

The acceptance of the S-100 as a de facto standard has proved to be a coup for the 8080 Z-80 related family chips over their Motorola 6800 competitors, because the first introduction to microprocessors for hundreds of thousands of Americans has been through these personal computers.

As soon as they sit down and start writing assembly language programs or interfacing hardware they are committing themselves to the Intel and Zilog chips.

When these young people move into firms and choose microprocessors their natural inclinations will be towards the Intel-Zilog family.

The value of this indoctrination probably far outstrips the actual sales value of processors used in all the S-100 boards.

It is rather surprising that no UK manufacturer has taken up the challenge of making boards or boxes for the bus.

I am afraid that this reflects rather badly on the UK spirit of enterprise because there certainly have been gaps in the market.

UK manufacturers would rather cultivate their own little garden than face up to US competition, even when the Americans have their hands tied by the import prices.

By producing one or two special boards for the UK market and interfacing to a US system, a British firm could have a small system better than any home-produced without the drag of requiring software development, disc systems etc.

When a British firm made a "look-alike" UK version of the Poly-88, it took the weak step of using its own bus and having a restricted product rather than make an S-100 version.

Even now there is a need for a S-100 board that produces a TV video signal (black and white and/or colour).

If a firm merely produced the empty S-100 box with power supplies and a reset button and put a US processor in it, there would be a large market. The US simply couldn't compete with our cheap labour.

The main problem about the bus is that the products from one manufacturer are not always immediately compatible with those from another.

This is usually only a bother when something exotic is attempted, like using a North Star disc with a Poly-88 bus.

Unusual boards, for example for recognition of input speech, are usually designed for one S-100 system only, with details of minor modifications that may be required for others.

Surprisingly the two original manufacturers, Altair and Imsai, have disappeared up-market and are both concentrating on turnkey business systems, still with S-100 boards, at correspondingly high ($5,000) cost. They have been replaced by a host of firms, many of which, such as Cromemco, North Star, Horizon, Poly and Vector, have agents in this country.

New S-100 equipment in the next year will undoubtedly be among the first to take advantage of technical developments. The advantages of a bubble memory board are obvious and the use of eight of the new Texas chips would give 256K bytes of non-volatile, fairly fast access storage.

Electrically erasable programmable memories (EAROMS) are now beginning to challenge ultra-violet erasable PROMS and this would be a useful product.

One gap in the S-100 repertoire is the lack of a large capacity disc storage, probably reflecting the original bias towards disc for its micro-based system and similar S-100 systems are certain.

Probably the biggest gap of all is the absence of an equivalent of Intel's In Circuit Emulator, a clever device which enables the gradual transfer of control from the development kit to the developed microprocessor stand-alone hardware.

The introduction of the 16-bit micros by Intel and Zilog will provide problems for the S-100 system because of the complication of extra pin requirements. This will apply to all development kits designed for 8-bit processors.

Meetings have already taken place and there is a lively dialogue taking place within the computer magazine Byte, about fitting the devices on to old memory. An IEEE standard S-100 bus should be defined soon.

To sum up, the S-100 system is ideal for anyone who would like a small computer for stock control, process control, microprocessor software development and access to high level languages at a system cost of between £1,000 and £4,000.

For some of these tasks, it is possible to buy a basic non-100 computer but it will not have the flexibility.

Dutch house offers floppy disc management

AIMED at the growing market for microprocessor-based business systems, a Basic compiler and floppy disc file management system including index sequential file handling is on offer from Holland Automation of Slough. The software runs in 20K bytes with the Motorola 6800 and in under 32K bytes on the Intel 8080.

Holland Automation is a £1.25 million software house based in Dordrecht with subsidiaries in the UK, France and Eire, and is entirely owned by its employees, who have to relinquish their shareholdings if they leave the company.

The file management system is already widely used on the Continent, being the one marketed by the highly successful West German company Devid Datentechnik on its DDC 110 system (CW, November 9).

Motorola's Dr Heikes quits in 'disagreement'

Dr Robert Heikes, who electrified the National Computer Conference in Anaheim, California earlier this year with a speech condemning the lack of software skills as a block on the development of technology, has left Motorola Semiconductor following a "philosophical disagreement" with the company.

He was with the company for 10 years and was vice-president and assistant group executive when he left.

Juna Barron, co-founder in the UK of the NEB-backed inmos, said that the company was looking out for senior people, and that he was aware that Dr Heikes was available.

Barron admitted an interest in Dr Heikes, mainly because the American has well known pro-European attitudes. He used to be European vice-president of Motorola.

Application packs

OFF-THE-SHELF application packages for a wide variety of business applications have been introduced in the US by Ohio Scientific for users of its floppy disc and fixed disc microcomputer systems. Said to be based on a database management system called OS-DMS, the library of programs is end-user oriented and menu-driven and includes an online inquiry program called Query. Suggested price of the software is $300 per application.

Eight I/O ports on board update

A NEW S-100 interface board with eight input-output ports is available from Thinker Toys of Berkeley, California. It is called the Switchboard, and all eight ports can be switched en bloc to any base address divisible by eight. There are sockets for 4K bytes of EPROM and 4K bytes of RAM which can be switched to any base address divisible by 4K.

The four parallel ports can each be switched between input or latched output, the two serial RS232C/TTY ports can be switched to any of 16 data rates from 110 bps to 19K bps, and each line in the strobe port and the attention port, used to activate output and input data transfers, is switchable between positive and negative pulsing.

Priced at $199 as a kit or £259 assembled, it is not yet on offer in the UK.

Japanese reply to US critics

JAPANESE and US semiconductor manufacturers are meeting next week to discuss American criticism of Japanese semiconductor sales in the US. The meeting in Palo Alto, California, will be attended by a mission from the Japanese industry consisting of Nippon Electric, Hitachi Machinery, Toshiba, Fujitsu, Mitsubishi Electric and Matsushita Denshi Kogyo.

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Participative systems design

Hawgood

Part 3 - By Enid Mumford, Frank Land and John Hawgood

A technique of participative systems design has been created by three specialists in computers and systems management: Enid Mumford, of the Manchester Business School; Frank Land, senior lecturer in computers and systems analysis at the London School of Economics; and John Hawgood, director of the computer laboratory at Durham University. In a specially commissioned series of five articles, Mumford, Land and Hawgood collaborate to describe their methods, drawing on their implementation experiences of the technique. Last week's article was incorrectly ascribed to Land alone. This week they write on the goals of system design.

'For a system to function effectively, it must be approved by those who use it and work with it'

SYSTEMS design has to be carried out in the context of the defined objectives or goals of an organisation. In a sense an organisation exists only to achieve some objective or set of objectives, expressed in the form of general statements such as "maximise profits" or "improve health care of the community."

But an organisation is made up of individuals and groups who, in addition to working towards the organisation's objectives, attempt to satisfy their own aspirations. In general an organisation will only function effectively if a wide range of group and individual goals are allowed to be satisfied, some of which contribute directly to the global objectives (for example, the goal "avoid stock outs") and others only indirectly (for example, the goal "improve job satisfaction").

In practice, even when different groups within an organisation agree on the range of objectives to be satisfied, there are wide divergences between groups on the values to be put on the different goals.

For example, the goal "improve job satisfaction" is likely to be regarded as a very important goal by the personnel manager and even more so by the trade union convenor, and perhaps rather less by, say, the marketing manager.

For a system to function effectively it is necessary for it to be approved by those who use it and work with it or within it, and for the system to yield net benefits in terms of organisational objectives.

We have developed an approach to systems design which assesses the benefits of a change of system in terms of the satisfaction of the objectives of all groups affected by the change as well as the global objectives of the organisation.

In our approach the diagnostic tasks of the efficiency analysis, job satisfaction analysis and future contingency analysis, described in the last article are closely associated with the tasks of setting goals, assessing benefits and choosing a design which the organisation will find effective.

Having identified the groups or individuals who will be affected by the proposed change of system, the design team has to list the goals which are considered relevant by the different groups.

Many of these goals will have been revealed by the diagnostic techniques discussed earlier. Others emerge as a part of the overall strategy of the organisation.

For example, one of the major objectives in looking for a new system in a bank was to improve the level of customer service in order to obtain a better level of deposits.

Efficiency analysis revealed among other things that: 1. customers had to wait over ten minutes on average at peak times; and, 2. a single customer had to deal with an average of three different groups of people in the bank for the typical range of business he conducted.

Future analysis suggested that the banking market would become more competitive and that customer service was vital to the survival of the bank. Job satisfaction analysis revealed that the present method of dealing with customers was poorly regarded by the bank staff, who felt their jobs were tedious and gave them little opportunity to communicate with customers.

On the basis of these analyses the design team could formulate operational targets for the new system. These included a reduction in peak time waiting to not more than five minutes, a system reorganisation based on customer groups, and if possible a system which would allow bank clerks more opportunity to relate to the customer. Of course there were many other goals related to other aspects of the system.

Each interest group is allowed to put a value against the set of goals. This "value" may be in the form of a numerical weight or in terms of a verbal assessment such as: "we think this goal is very important" or "we think this goal is not important."

Different groups tend to put different values to the different goals. The organisation has to decide how important it is to achieve the different goals.

In our example from the bank, the decision takers might have decided that all the goals were valid, but the reduction in peak time waiting was the most important, while the improved job satisfaction goal could be sacrificed if it proved difficult to achieve.

Under different circumstances — for example, if the future analysis had suggested that it was going to become more and more difficult to recruit good bank staff — the decision takers might have reversed their valuation.

However, best results are achieved if an agreed value can be attached to each of the goals by a process of negotiation between the interested parties. This may result in certain compromises or trade-offs in terms of the operational goals. In return for attaching more weight to a job satisfaction goal, the bank employee group agreed to give a higher value to a departmental reorganisation much desired by management. But if, after negotiations, conflict still exists it may be best for the final system if the area of conflict is left out of the goals for the systems change.

Once the goals and their relative values have been determined, the design group attempts to define alternative systems or strategies which might help to achieve these goals.

Some designs will go a long way towards achieving certain goals, but will fail to achieve others. And alternative designs will have different effects on the different goals. Each design strategy is ranked in terms of its effect on each goal.

Clearly the strategies which further the most highly valued goals are better for the organisation than strategies which do not contribute to the achievement of these even if they perform very well in relation to less valued goals.

The design strategy yielding the highest return for the organisation is the one chosen for the next stage of the process.

This consists of a series of tests of the sensitivity of the design to possible changes in goal or goal values, or changes in available technology arising from the future analysis.

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LETTERS TO THE EDITOR

'Better to keep apart word processing and DP'

THE article on 'the automated office by Fred Lamond (CW, October 12) was a quite useful review of automated aids for people who work in offices. It would probably have been much more useful to potential users and suppliers if it had been presented from a viewpoint of the needs of office workers for information handling aids rather than listing examples of existing hardware types.

The section which discussed the view attributed to Booz Allen and Hamilton "that word processing and data processing should be kept separate," contained several very misleading statements that should not go unchallenged. Let me just take up one of the more extreme statements: "all that is required to turn any business minicomputer into a word processor is an upper/lower case character set and maybe a daisy-wheel printer". This is extremely misleading if Lamond had in mind the ordinary typist or secretary as user of word processing. I presume he had such a user in mind and I feel sure that Booz Allen had.

Dr Pat Coen

I conclude that Lamond has thought about the problem and arrived at the wrong conclusion, or perhaps he has been taken in by some of the uninformed comment churned out of rather unprofessional hardware vendors, many of whom would like to have us believe that the statement above is true and some of whom possibly even believe it themselves. Statements such as this often represent the triumph of the hope of the desperate product line manager over a proper requirements of analysis and system design.

I can assure Lamond that a great deal more is required to provide an effective word processor for use in a general office environment. First of all, while a high quality display is desirable for business applications, it is essential for word processing. In a heavy editing environment, where the maximum productivity gain can be expected, the typist spends a much higher proportion of her time looking at the screen than in the average business application use. A special keyboard design for typing and text editing is also highly desirable.

One of the key elements in any word processor is the ease of use, which depends on the user interface provided. Many business minicomputers are much too inflexible in their design and inadequate in their user interface to make them suitable as word processors. Even some of the word processing products suffer from the obvious defect that they were designed by data processing people, who had no understanding of how typists or secretaries approach their work in typing or editing. There are several systems which tend to have a 10-20 question interview with the typist before she can type the first useful character, whereas all she wants to do is the equivalent of getting a piece of A4 paper, letterhead or company form and start typing on it.

There are several other differences relating to factors such as good structures for text files, flexible handling of format control and speed of system response required, which space will not allow us to discuss here.

Naturally people designing systems who do not understand the typing and editing process are unlikely to understand the additional system management aids which are likely to be useful in this environment. Even people who understand the typing process on typewriters or non-video automatic typewriters also seem to have a gap in their knowledge when it comes to designing the central management aids which ought to be available. These would typically include document copying, security copying of discs, generation of job directories, automatic purging of out-of-date jobs and general reporting on the usage of keyboards, printers and utilisation of discs, functions which are essential for the efficient management and operation of a text processing operation.

While not wishing to enter into the Lamond/Booz Allen controversy and not necessarily agreeing with the reasons attributed by Lamond to Booz Allen for their view that word processing and data processing should be kept apart, I would like to put the view that it would be better in the short term future to keep them apart principally to avoid the damage to be done to organisations who would believe the statement that "all that is required to turn any business minicomputer into a word processor is an upper/lower case character set and maybe a daisy-wheel printer".

Dr PAT COEN
Development director
Logica,
London W1.

Relational databases

I REFER to your series on 'Relational Databases' written by Max Stewart (CW, October 19) and respectfully wish to correct the designation attributed to Stewart in this introductory article.

He is currently technical support manager of Leyland Vehicles, Bathgate, West Lothian, but it was as technical manager for the Computer Department of the Central Regional Council (Scotland) that he installed the operating software for one of the UK's first IBM 3602 SNA distributed database systems. As an organisation we are proud of the achievement and particularly glad that we had someone of Stewart's calibre to install and manage this highly successful project.

JOHN A. GOW
Computer Manager
Central Regional Council,
Stirling.

VDUs in 1998 will make today's look like hand cranked telephones

Keith Jones talks to DEC's micro development vice-president

CLAYTON . . . "graphics will become readily accepted by terminal operators."

MOST display terminals six to seven years from now will provide graphics facilities as a matter of course. This is the view of Dick Clayton, the Digital Equipment vice-president in charge of microprocessor developments, small systems and terminals.

Talking to me during a visit to DEC's plants in Europe, Clayton commented, "We cannot predict exactly what VDUs will be like in 1998, but they will make today's look like hand cranked telephones.

"In 18 months from now we will be introducing an improved version of our LSI-11 microcomputer that will provide a terminal with as much power as any of our PDP-11 machines, apart from the top end 11/70.

"With that sort of power the terminal will be able to handle all the graphics manipulation and the central computer will only be used to store graphics matrices and ship them down the line.

"Graphics will become really accepted by terminal operators because it will present them with information in a form that will be far clearer and more comprehensible than alphanumeric information by itself."

Clayton sees the continuing fall in the cost of processor power and memory as creating a demand for more features at the same price rather than for cheaper products.

"With our VT100 video terminal, for example, we have increased reliability by using error correcting code in memory, even though this adds 20% to memory cost, and we have extended the amount of ROM by 20% to provide automatic set-up routines and automatic test during power up."

He also predicts that most VDUs will soon be 132 columns wide.

'Smart to buy from outside'

ON DEC's position in semiconductor manufacturing, Clayton stressed that DEC was not interested in becoming a supplier of devices to outside firms on a large scale.

"We only build the devices that the rest of the industry cannot supply us with, like the LSI-11 chip set.

"But we buy in all our memory devices because there are so many suppliers to choose from that it is smart to purchase from outside. As far as 64K bit RAM devices are concerned, I think that they will be too expensive for us to buy at least for another two years."

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DESMOND PITCHER, the new managing director of Plessey Telecommunications International, the management company responsible for the Plessey companies' worldwide interests, is flanked by Plessey Telecommunications Limited managers as he tours Plessey's Chorley (Lancs) factory which makes TXE4 telephone equipment for the Post Office. On the left is Huw Edwards, director of administration, and on the right Alan Stokes, the Chorley site's general manager. Pitcher previously held several senior positions with the Sperry Rand Corp, including managing director of Univac UK and was also managing director of Leyland Vehicles. Here he sees hand wire wrapping of an exchange rack.

Automated Office seminar

A CONFERENCE entitled "Towards the Automated Office — the First Steps" is to be presented by Information Studies Ltd in London on November 29-30.

It will look at ways in which automation is already being brought into offices, in the form of word processing, computer terminals, facsimile, micrographics, and communications systems.

Howard Anderson from the Yankee Group and Bruce Hosenyager from Citibank will be among the speakers.

BCS SPECIALIST GROUPS — LIVING WITH COMPUTING

The British Computer Society's specialist groups are organising a conference in London from January 4 to 6, called BCS 79, Living with Computing. In this series of articles, the work of the specialist groups and their BCS 79 plans are described. This week the focus is on the Specialist Group for the Disabled, in a contribution from the group's chairman, Derek Nicholson, who is managing director of Emphetic Computer Services (Stoke Mandeville) Ltd, of Aylesbury.

Disabled have much to offer — given the chance

COMPUTING is a profession particularly well suited to disabled members of our community, and for this reason the Specialist Group for the Disabled was set up by the British Computer Society at the request of some disabled programmers, to create a focal point for activities relating to computing and the disabled.

The group's main objectives are:

- To bring to the attention of the severely disabled the potential opportunities that exist for employment in computing;
- To bring to the attention of the public, including employers, the resources and talents to be found among the severely disabled;
- To help the disabled practitioners integrate themselves more fully into the computing community.

The group has worked closely with government and educational bodies to develop aptitude testing that does not penalise people with physical disabilities. To date, two training courses have been held under the training service agency Tops scheme and proved to be extremely successful — so much so that a third course is now in the pipeline.

The finding of jobs for the disabled trainees (and also for those disabled who are practising professionals) is a very complex task. This is due to their location in the country and their different disabilities (ie, anyone in a wheelchair needs a computer installation on the ground floor, or a building with lifts. Someone with difficulty in writing, would need a special terminal).

The Specialist Group for the Disabled thanks Computer Weekly for setting them on the road to success on two accounts. In 1976 and 1977, Computer Weekly donated the proceeds of its Anniversary Balls to the group for the funding of, firstly a National Employers Survey, to find those employers who would be willing to employ severely disabled computer professionals and ascertain the facilities available; and then towards the development and launching of the "Mate" terminal being developed by a small research team at the Essex University computing centre.

The Specialist Group for the Disabled is trying to offer all severely disabled the opportunity to undertake a worthwhile career. Getting this offer to the disabled is another matter. We would like to see all BCS branches appointing someone within their branch to be responsible for the disabled in their area, and go out and find them. Many branches are doing this already and helping them towards their goal.

At present there are two branches of the Specialist Group for the Disabled in London and Manchester.

It is hoped that a third will be launched in Wales soon. Others are seen on the horizon.

The survey results are now on file and ready for use. It can, of course, be updated if any employer not on file believes that he could employ disabled persons.

The survey did show that many employers could not visualise how certain disabilities could cope with computing (ie, blind, spastic, speaking and writing difficulties). The group is aiming to educate people in these matters, because when they know how the difficulties are overcome, they may change their minds and more job opportunities could become available to the severely disabled.

For BCS 79, the disabled group will, on the afternoon of January 5, present "Computers for the Disabled — the Disabled for Computing." The chair will be taken by the group's treasurer, Dr Adrian Stokes.

The programme will include a talk by Dr Williams, of the Post Office, entitled Viewdata for the disabled. The talk will show how the development of viewdata could benefit the disabled, by providing information direct to their home and offering the ability to order or send messages at a touch of a key.

Dr Chris Evans from the National Physical Laboratory will be talking and demonstrating Mavis, a computer terminal for the disabled. This terminal is really worth seeing. Mark Jenkins, a consultant with Langton Information Systems will give the reasons why "Higher education computing for the disabled" can be a benefit to them.

D. Croisdale, from the Civil Service College, will present a talk on Computerised Braille, describing the contribution computers are making in the production of Braille reading material, and speculating on future developments.

On the Saturday, January 6, the group will be taking part in the Open Day Exhibition.

Visitors will discover that the disabled have a lot to offer in computing, given the chance.

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Spare parts ordering system should put Leyland in the lead

An advanced spare parts ordering system is to start live operation at Leyland Vehicles within the next five weeks. The system is designed to ensure that any broken down Leyland bus or truck is restored to roadworthiness within 24 hours, and should give Leyland an edge over all its UK rivals in this competitive market.

The system was first demonstrated to distributors at last month's Motor Show in Birmingham, where it attracted favourable attention. It will operate via IBM 2741 terminals situated at the premises of 40 distributors throughout the UK and Continental Europe, and connected to an IBM 370/148 at Preston, Lancashire.

When a bus or truck breaks down, the distributor concerned will be able to transmit an order immediately to the main computer centre. This is done interactively, to allow the distributor to make alternative decisions if, for example, a certain part is out of stock.

When the order is complete a confirmation is transmitted back down the line. Within an hour, the relevant parts will be picked from the warehouse and prepared for immediate despatch to the customer.

This new system is only part of an ambitious DP programme undertaken by the spare parts division. Although the division is one of four making up Leyland Vehicles, it has sole responsibility for its own DP.

The division has only had its own in-house computer system since January. Until then it relied on bureau services. The 370/148 is used for stock and order processing, and has more than 80 terminals online already, including the 40 currently used by the distributors for stock and order inquiries.

Leyland received considerable help with the software from Cincom. The company helped with the conversion from the bureau to an in-house system and has supplied Leyland with its Total database management package, [illegible] associated Socrates report and extract system, and the Environ/1 [illegible] processing monitor.

In future, the number of distributor terminals will gradually be increased, to 80 by the end of this year and about 100 by the end of 1979. The service will [illegible] able to the distributor [illegible] improve still further [illegible] stock orders can be placed [illegible] the terminals [illegible].

Stock orders are [illegible] the emergency [illegible] road orders [illegible] of many more [illegible] placed regularly [illegible].

HP calculator helps plan hospital patients' feeds

By Dr Michael Goggin, consultant in renal medicine at the Kent and Canterbury Hospital

IT happens quite often in hospital that a patient is not able to take fluids, salts, and nutrients by mouth. This set of circumstances can arise when a patient has recently had an abdominal operation, in which a portion of the bowel had to be removed and the remaining ends of the bowel needed to be joined up. After any serious surgical operation, the nutritional needs of the body are increased both with regard to protein and calories. Even in a non-surgical patient, sometimes it is not possible to feed by mouth, and feeding via a vein has to be carried out.

The amount of nutrients varies according to the condition of the patient, and although the principles are quite straightforward, there are reasons why any aids that can be provided are welcomed by the doctor.

To solve this problem, a programmable calculator, a Hewlett Packard (HP) 97 has been used. Previously (CW, July 10, 1975) we have described the use of an HP 65 in easing the work load of a dietitian. Here the database was very large, and this proved to be a disadvantage of that system.

In intravenous nutrition, although the "food" preparations available are too many to be kept easily in the head or the pocket of the doctor, the number used is likely to be less than 30.

In the broadest of terms, five items are important to the doctor: Calories, protein (as grams of nitrogen), sodium, potassium and fluid. The prescriber is faced with two stages of decision-making: determining the requirements of the patient, the type and amount of fluid he uses to meet these totals.

In the HP 97 IV PAK, there are two programs, one for requirements and one for intake, and the available solutions are stored as data on magnetic strips similar to those used to input the program. (Solutions used are already made up in certain volumes, ie sizes of container.)

Requirements. To arrive at these, the program is provided with the record number of the patient, followed by his highest temperature and weight from the previous day. From a table of clinical circumstances varying from the uncomplicated patient to one with very serious burns, a clinical type is chosen and a code number input.

The sodium and potassium losses of the patient may be calculated beforehand and fed in, or calculated by the program from formulae using blood values.

The program measures the fluid requirements of the patient, and allowances are made for excess losses due to high fever, if present. Following that calculation the requirements of calories, grams of nitrogen, sodium, potassium and volume of fluid are printed out.

Intake. When requirements have been determined, the intake program is used. The passage of this through the card reader preserves the requirements data. Data on available solutions is fed in, and solutions and their volumes are chosen by the operator. Then the program subtracts the amounts of the nutrients in the chosen solution from the requirements totals.

At this stage, the operator can reject or accept his choice. If he rejects, then the requirements registers return to their previous values, but if he accepts, the solution code, volume, minimal administration rate and cost are printed.

The ratios of fat calories to total calories and the total calories to grams of nitrogen are calculated and printed.

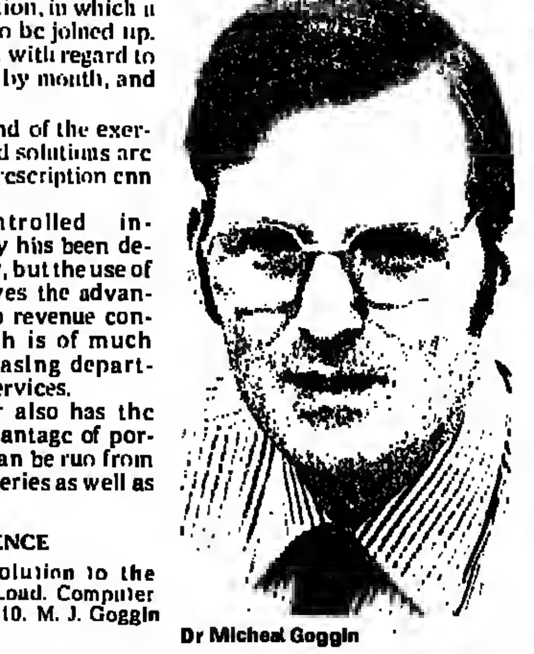
This process is repeated until the requirements are almost met. An opportunity to reverse one's original decision to accept is given. At the end of the exercise the subtracted solutions are deleted, and the prescription can be written.

Computer-controlled intravenous therapy has been described previously, but the use of the calculator gives the advantage of having no revenue consequences, which is of much appeal to purchasing departments of public services.

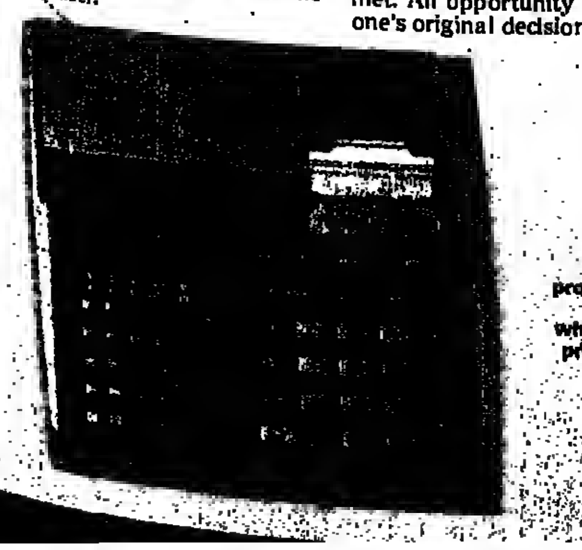
The calculator also has the very obvious advantage of portability, since it can be run from rechargeable batteries as well as the mains.

REFERENCE

Pocket-sized Solution to the Dietitian's Work Load. Computer Weekly 1975, July 10. M. J. Goggin and D. Lawrence.



Dr Michael Goggin



The Hewlett-Packard 97 programmable calculator, which accepts programs and data on magnetic stripe.

NEWS IN BRIEF

UK looks to Japan

BRITAIN'S failure to exploit research profitably in industry means that we must now start to import technology under licence from Japan, according to a report from the House of Commons Committee on Science and Technology. The Committee recommends to expedite this an increase in the scientific staff of the embassy at Tokyo; subsidies for British technologists to study in Japan; and the establishment of courses in Japanese.

Compensation

THE fall in the US dollar against the yen has meant that Univac's minority-owned Japanese joint venture, Oki Univac Kaisha has now agreed to compensate Univac for the adverse effect by reducing the transfer prices of hardware supplied by OUK for sale in other countries.

First PPS

THE first Honeywell Page Printing System to be installed in the UK is now running at EMI's computer centre at Hayes, Middlesex, where it is being integrated with Honeywell Level 66 mainframes. The PPS, valued at £160,000, will be used to print customer invoices and statements, management reports and instruction manuals. It runs at up to 18,000 lpm.

Banking package

A BANKING software package with modules for dealing with foreign exchange, commercial loans, Eurobonds and variable term accounting has been introduced by CMG (City of London) Ltd. The complete package also includes general ledger and management reporting modules and costs £75,000. Modules can also be supplied individually for prices that include £15,000 for the Eurobond module. The Italian International Bank is the first user.

1,000th customer for OS/3

THE 1,000th customer for a Univac OS/3 based system is London Brick of Bedford, which has installed a 90/30 to handle sales, distribution, and production control applications.

The system features a 196K central processor with 58 Mbytes of disc storage, and two UTS terminals with four VDUs each.

Previously, London Brick used an NCR Century 200 system, but with the 90/30 it now plans to introduce a stock control system for its manufacturing subsidiary, and an integrated accounting system and purchase ordering system for itself.

Worldwide OS/3 sales now total about 2,300 and these are valued at over $500 million.

New technology

● From front page

nal Labour Organisation to disseminate information on national experience in this field, and to start working out internationally acceptable guidelines, involving governments, unions and employers, for the introduction of computer-related systems.

Delegates from over 22 unions in 13 countries attended the conference and a UK delegate, David Cockroft of APEX, noted that the UK lagged behind other trade unions in Europe in tackling the impact of computerisation. In Norway, for example, there is agreement for collective consultation on the introduction of new technology, such as that recently called for by the Employment Minister Albert Booth (CW, October 12) and in Austria and Sweden there are large scale training programs on the impact of the technology for trade unionists.

The conference also called for consultation between trade unions and systems manufacturers on potential health problems associated with VDUs, as well as recommending that VDU users should be offered regular eye checks and rest periods by employers.

$4.5m contract

AVIS has awarded Harris Corp a $4.5 million contract to develop computer terminals designed to meet the specific needs of car rental outlets.

"Computer Weekly", "Data Processing" and "Systems International" present

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RELATIONAL DATABASES

Implementing a system of fourth normal form files

Part 5 of the series by Max Stewart

In this the fifth part of Max Stewart's series on the development and use of relational databases, he discusses the pros and cons of implementing a system of fourth normal form files. Stewart is divisional technical support manager for Leyland Vehicles.

IN this part and Part 6 the pros and cons of implementing a system of fourth normal form files will be discussed. Remember that until now we have been concerned almost entirely with producing a logically sound file structure. This structure has two possible deficiencies in practice: First, it takes no account of the applications which will use it; and, second, access and update performance may be unacceptable. This is determined partly by the file handling or database management system to be used.

Database management systems can be divided into three main types: hierarchical, such as IMS; Codasyl set-structure, as IDMS or SIBAS; and relational, such as ADABAS and INQUIRE.

Neither of the relational systems mentioned is a full relational database management system, but both are biased towards posing complex queries against a logically related collection of simple files. Many experimental relational database management systems are extant. One of the best known in the UK is IBM's PRTV which was developed at its scientific centre at Peterlee. IBM Peterlee has also produced IPS which provides local government planners with powerful data manipulation capabilities similar in concept to those of PRTV. The relational approach is being pursued with great zeal in the US with at least five semi-relational commercial systems (Model 204, RAMIS, Datacom DB, ADABAS and INQUIRE), and the odd full-blown relational database management system (MAGNUM).

Perhaps the most significant relational database implementation is IBM's System R. This system is still experimental but is a cornerstone of IBM's large system architecture for the 1980s. We shall return to this theme later.

Fourth Normal Form Implementation. When FNF files have been constructed, they must be physically maintained by a conventional file handling system or by one of the three types of database management system.

Conventional files or relational DBMS. Holding all files in fourth normal form in a conventional file system or in a database which is maintained by a relational DBMS is an ideal which for efficiency reasons is not always attained.

A file with records containing repeating groups is not in fourth normal form. It may, however, be more efficient to access one file with a repeating group rather than the two or more corresponding FNF files.

Several opposing factors determine whether it is more efficient to use two simple (unstructured) files or a single file with a repeating group.

- If the file management system or DBMS supports data compression, calculating the position of the n'th occurrence of a repeating group takes a disproportionately large amount of time if "n" is large.
- Random retrieval of records from two files may take at least twice as much elapsed time as for one file if the records are not already in the buffer pool from a previous retrieval of each block and if multiple read requests cannot be overlapped significantly. The degree to which read requests can be overlapped depends partly upon the hardware configuration. Maximum overlap is achievable when each file is on a seperate disc pack feeding a separate channel through a separate controller.
- Issuing a retrieval command against a key in a repeating group (if the system supports this) will return the qualifying records but not usually the qualifying group occurrence numbers. It may subsequently be necessary to read each group occurrence in a qualifying record to find those which satisfied the search criterion.

File characteristics and use. Any guideline is bound to be violated by unusual applications. With this in mind, the file or database designer should try to answer the following questions:

Will FNF files substantially ease any addition, update or deletion problems (see Part 4)?

Will a query language be used for ad hoc queries by non-programmers? If so, the files to be interrogated should not have records with repeating groups unless fields from a group and fields from outside a group need to be retrieved together. Non-programmers should find output from simple linear files easier to understand because of its tabular nature.

Will there be many occurrences in a repeating group? If so, assess the CPU time overhead, especially if the group has a large number of fields. Note that the number of occurrences may be limited by the disc track size (IBM's indexed sequential access method, for example, supports variable length records but not spanned records).

Will files usually be accessed alone, or in combination? If they will usually be accessed alone, consider the disc space overhead in holding any cross-indexes. If they will usually be accessed in combination, consider the I/O and CPU time overhead in using the cross-index mechanism, particularly for update runs.

Procedure for combining files. The designer should now have some knowledge of the advantages and disadvantages of combining his files. Some compromise is necessary in practice because different processes may use the files in different ways and in different combinations. A process may be a suite, a program, or part of a program. Programs comprise the same process if they use the same files in broadly similar ways (eg read, update).

A weighting should be assigned to each process. This weighting takes into account the response time needed by the program for access to the database or file system, the amount of processing done in one run, and the frequency of runs. An online transaction processing program will usually have top weighting.

The files used by each process should then be listed against the weighting of that process. Files are then combined if it is advantageous to do so. Conflicting combinations are resolved using the process weightings.

If a particular file is not used by any application, it should be deleted. Such a deletion may occur when there is more than one relationship between two data items but only one of these relationships is used by the processes.

Files can be combined in several ways. The recommended way is to make records from one file repeating group members in another file. See the following example.

Process	Weight	File used
TP program	9	1,2,3
Frequent batch program	5	3,4,5
Small year end program	1	1,4

Notes: File 2 can be made into repeating groups in File 1. File 4 can be made into repeating groups in File 1. Files 1 and 3 are updated by the TP program, and File 1 by the year-end program. The year-end program does random queries on Files 1 and 4 together and also updates File 4. The frequent batch program does random queries on Files 3, 4 and 5. File 5 could be made into repeating groups in file 4 except for the fact that the number of group occurrences may exceed an implementation limit.

Result: File 2 is made into repeating groups in File 1 to speed up access for the TP program. File 4 is not combined with File 1 to help the year-end program because longer records would have to be retrieved for the TP program and the records may thus span more than one block. Files 1 and 4 are not cross-indexed to help the year-end program because the TP program would be slowed down when updating File 1 by the frequent alterations to the cross-index tables. Lack of cross-indexing degrades the retrieval speed on Files 1 and 4 together for the low-weighting year-end program.

Part 6 will examine mechanisms to relate files in both conventional file systems and in relational database management systems.

OPPORTUNITIES IN WALES & THE WEST COUNTRY

It's such a pleasant way of life in the West

By Alan Rowntree and Pam Webb

PEOPLE tend to think of the West Country and the South of Wales in terms of a couple of weeks of summer holiday and then back to the Smoke for the rest of the year.

In fact it is an area where people live and work the year round in lovely towns, and in this article you will find some of the reasons that attract them to this way of life.

Firstly there is a tremendous variety of computer jobs throughout the Western counties, with a high level of demand for staff to fill them.

Opportunities for outright trainees are limited, with the exception of graduates in numerate disciplines such as computer science, mathematics, physics etc.

The great demand is, of course, for analysts and programmers having one to seven years' experience. For them the aim is to be able to review available opportunities throughout the region in order to pinpoint the most relevant ones according to their preferences.

This is because there is a great deal of difference between the various localities as regards types of countryside, employment, education, housing, salaries and so forth.

The most senior positions are, by definition, less numerous and more likely to be filled by staff already residing in the West Country. So local knowledge is essential if one is to become aware of them as they arise.

Salaries for new positions are slightly below, though in some cases comparable with, those of London and the South East. But where they are lower they are amply compensated for by the much lower housing costs, and the less tangible but very real quality of life in the West.

Programming opportunities cover industrial and commercial applications systems software and an increasing amount of real time and minicomputer developments. The prevalent computer languages are Cobol, PL/I, RPG II and Basic on the commercial side, and on the technical side Fortran, Coral 66 and Assembly languages.

IBM and ICL mainframes share much of the market between them. Univac has made inroads into the mainframe scene, while DEC has been active in securing minicomputer orders.

It is difficult to generalise about such a wide and constantly changing picture, and many opportunities exist for work on Honeywell, Burroughs, NCR and several minicomputer manufacturers besides.

With the volume of demand for experienced staff, programmers are able to extend their experience to new and different machine ranges, as well as consolidate their existing machine expertise.

There is also a strong demand for specialist expertise in particular areas such as communications database, TP, packages etc.

Overall, the job scene for a programmer thinking of moving West is very favourable indeed.

A similar wealth of opportunity exists for experienced business analysts, designers, analyst/programmers and for programmers seeking to move into systems. The requirement is for good general experience of analysis, and/or design of one or more of the usual commercial type applications, with a particular call for insurance and building society experience.

The computer manufacturers in the area are predicting an annual growth of 25% in terms of capital investment in computing equipment. While one or two new names will appear among computer users, the majority of this expansion will be additional investment by current users of hardware.

One of the Bath architectural masterpieces, The Circus.

As in the rest of the country, however, the enhancements will be mainly in the mini market, either as stand-alone equipment or as a facility connected to a host mainframe. In both cases this is likely to cause the hitherto popular approach of having a group resource of computer personnel to be superseded by a more decentralised structure.

It is likely that the result will be a critical shortage of analysts and designers with business expertise, since each application to be mounted on a mini will require a business knowledge which is very local. Since the West benefits from the existence of a number of "big city" subsidiaries, this need will offer greater than average opportunities.

An often expressed criterion is that the analyst must have seen at least one system through to implementation. The work to be done includes analysis and design of new applications, feasibility studies upon potential applications, and reimplementation of existing systems using advanced equipment and techniques. So there is plenty of opportunity for analysts and designers of all kinds.

One of the best solutions for the staff-seeking DP manager is to plan for, and use, contract personnel to solve peak problems.

Staff who enjoy the independence of contract work can benefit from a move to the West in the same ways can permanent employees. To operate in a software house gives him/her all the advantages of working independently, plus the added advantage of continuity of work, employment benefits and, above all, career progression.

The jobs become available across a wide geographical area. This provides a variety of attractive places to live in, but does not make it easy for the individual job hunter to identify relevant positions. This is where a reputable recruitment agency is essential to provide him/her with a comprehensive monitoring service.

As for housing, there are indeed cottages up country lanes among the many picturesque villages. At the other extreme, new housing developments exist in most places, providing all modcons at relatively low prices. Between the two are other possibilities such as large Georgian and Victorian properties whether sold as complete houses or spacious flats. Each of the towns has plenty of estate agents, and it is worth a weekend visit to see what is available in a particular area. It is also important to note that most employers offer realistic relocation expenses to attract employees from outside the area.

Education in the area is generally of a high standard, due in some measure to the fact that teachers themselves want to live and work in this attractive part of the country. This applies both to State and private sectors of education. Further education is well provided for by the well known universities in Bath, Bristol, Exeter, Swansea and Wales.

The West Country and South Wales offers a pleasant way of life with the unpleasantness of commuting to and from work cut to a minimum.

The opportunities are there for a wide variety of career paths—so "Come on over, the water's lovely"!

** Alan Rowntree is head of the Management Services division of Walker Weston Associates Ltd, of Bath, and Pam Webb is the company's senior consultant on the recruitment side.*

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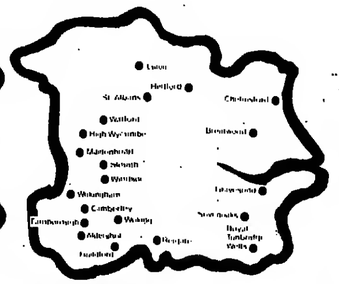

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One of the major bonuses of these positions is the opportunity to live in a part of the country that most people only see at holiday time—a bonus that is impossible to put a value on.

G III OPERATOR
TO £4,550 inc. shift

Our client's major force in Retailing are looking for an operator for their 1903T installation.
Applicants should have at least 2 years' experience of 1900 operations (on-line and batch) and a knowledge of G III.
The computer centre is located in the heart of Somerset and fringe benefits include staff discount of up to 30% on food, clothing, furniture and electrical goods.

For further details of these position and many others in the South West ring (0272) 211036, or write to ATA COMPUTER RECRUITMENT, 38/38 Baldwin Street, Bristol 1.

LONDON (01) 637 0781 230 Gt. Portland St. W1N 5HG
MANCHESTER (061) 832 5856 66 Cross St. M2 4LA
BIRMINGHAM (021) 643 1994 Woolworth Building, 102 New St. B2 4HQ
BRISTOL (0272) 211035 Equity and Law Building 38/38 Baldwin St. BS1 1NR
EDINBURGH (031) 226 6361 Angus House, 24/26 Frederick St., EH2 2JR
CRAWLEY (0293) 514071 36 The Broadway

OPPORTUNITIES IN WALES & THE WEST COUNTRY

OUR SITUATION IS DEVELOPING

Mettoy Limited are market leaders in toy manufacture with an impressive growth record based on the success of the familiar "Corgi," "Playcraft," and "Wembley" toy ranges. In line with overall company progress, we are seeking to recruit key Computer Personnel to make an immediate contribution within a stimulating development environment.

Transfer of the work-load to an ICL 2960 under DME is now complete and the next stage in the move to VME/B is underway. Current activities involve the redesign of existing applications and commitment to the selling of excess machine capacity to both local and remote users.

PROGRAMMING MANAGER
C.£7,000 + Car

Reporting directly to the Computer Manager, suitable candidates will have a sound COBOL Programming background, and preferably will be able to demonstrate in depth technical knowledge, combined with proven management skills. The main areas of responsibility will be for hardware development, systems software and application programming development. Essential qualities in candidates will be the ability to lead, supervise and motivate the members of the Programming department and the capability to communicate with both user groups and all levels of management.

SENIOR SYSTEMS ANALYST
C. £6,000 + BUPA

Reporting to the Systems Manager, suitable applicants will be able to show three to four years' involvement in the design and successful implementation of major systems. Ideally within manufacturing/engineering areas, although a background of Financial systems would also be considered. Initial responsibility will be for the revision and development of systems in line with the current program.

BUREAU SALES EXECUTIVE
C. £7,000 + commission + Car

This new venture provides an excellent opportunity for a motivated self-starter to initiate and develop business to a profitable level within the Company. Working closely with operational and technical support staff you will enjoy a high degree of autonomy in business negotiation, customer liaison and sales development policy.

SYSTEMS ANALYSTS
C. £5,000

Reporting to the Systems Manager Accounting, the suitable applicant will have a minimum of two years' systems related experience, and will join a small team currently involved in the further development of the accounting systems. Some knowledge of on-line systems would be an advantage, preferably within financial/commercial areas.

Swansea is ideally situated in one of the most beautiful areas of South West Wales, and is readily accessible to other major centres and the attractive Gower Coast. The Company offers generous fringe benefits, including a comprehensive relocation package, a 5% contributory pension, staff discount and involvement in productivity schemes.

If you feel you have the potential to grow within this growing organisation, apply in the first instance, by letter or telephone, to Chris Wilson. When writing please include your own personal history or curriculum vitae.

Sanderson
EXECUTIVE RECRUITMENT 9A Princess Victoria Street, Clifton Bristol
TELEPHONE 0272 39302

WORK WEST

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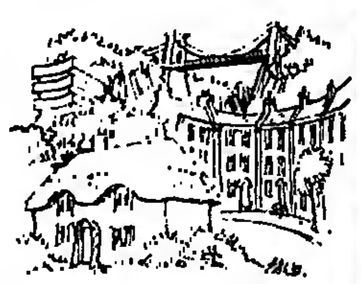
BUSINESS ANALYSTS
SYSTEMS DESIGNERS
SOFTWARE PROGRAMMERS
SCIENTIFIC & TECHNICAL PROGRAMMERS
CUSTOMER SUPPORT
MINI PROGRAMMERS
ANALYSTS/PROGRAMMERS with RPG or COBOL experience

You've read all about the benefits of living in the West.
NOW do something positive. We are currently recruiting experienced D.P. staff at all levels for local companies. Salaries range from £3.5K to £10K and re-location is paid in the majority of cases.



For further details in strict confidence write or phone:

Walker-Weston Associates Limited
Specialists in Computer Recruitment
Woodlands, Lower Bristol Road, Bath
Avon. Tel: Bath 317890

Zimmer GREAT BRITAIN

Zimmer Orthopaedic Ltd., manufacturers of ... Group ... Folding Wheelchairs, are seeking to appoint a

SYSTEMS ANALYST/PROGRAMMER
c.£5,000

This position offers an opportunity to join a dynamic and existing Data Processing Department.
The successful candidate will be equal between ... will report to the Data Processing Manager and should have experience in commercial systems, a knowledge of B.S.I.S. is essential.
The position involves both programming working on ... Digital PDP 11/40 computer.
Conditions of employment are good, and include contributory pension scheme, staff productivity bonus, sick pay scheme and ... days holiday per annum.
Apply in writing with full C.V. to:

Group Personnel Manager
Zimmer Orthopaedic Ltd.
Industrial Estate, Bridgend, Mid Glam CF31 3PY

System Analysts Programmers

Cwmbran Software Services was established by Ferranti in Cwmbran, Gwent four years ago. We are currently primarily concerned with the development of basic software for the F1600 range of computers, the F100-L microprocessor, and the military version of the Argus computer and, on the applications side we are involved in the provision of programs for a number of real-time systems using these computers.

Our workload is continually expanding, and involves the programming of an increasing number of other manufacturers' computers.

Staff at Cwmbran may be involved in work leading to detachment on customers' premises in the UK or abroad (with extra allowances paid for such detachment).

We require further staff for our teams developing:

- Operating Systems
- Compilers
- System Development Tools
- Real-Time Systems
- Applications Software
- Engineering Support Programs

To fill our current vacancies we would prefer graduates with one to four years experience in programming, electronic engineering or systems work, but are happy to consider graduates in numerate disciplines with no previous practical computer experience. In addition we have some vacancies for Trainee Programmers with 'A' levels.

If you are interested in our activities and location, and your qualifications and/or experience approximate to our preferences stated above, please write to: Ferranti Limited, Cwmbran Software Services, Gwent House, Gwent Square, Cwmbran, Gwent NP4 1PL or telephone Lynne McGregor on (06333) 67761. Please quote ref. no. CB1/CW

These posts are open to both male and female applicants

Cwmbran Software Services

FERRANTI
Selling technology

MARTINS COMPUTER SERVICES
D.P. Recruitment Specialists for the Midlands/West Country area

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Please find below a few positions from our register. We have over 300 jobs to choose from.

PROJECT ANALYST DESIGNER, at least four years in Systems Design. Area: Trowbridge. Salary ... SA200.

SYSTEMS ANALYST. At least four years' experience on ICL 1900 or Mini hardware. Area: Bridgwater ... c £4750. Ref SA146

PROGRAMMER/ANALYSTS. Experience with real-time mini computer applications, language ... Area Warminster. Salary according to experience but competitive. Ref P269

SENIOR SYSTEMS ANALYST. At least three years' experience with IBM Systems 3 using RPG ... Wiltshire. Salary to £5800

SENIOR PROGRAMMER. 4 years' experience, using IBM Hardware, using TSO and suitable ... applications. Area: Gloucestershire. Salary to £5000. Ref P380.

SYSTEMS ANALYST. At least two years' Systems with working knowledge of Cobol. Area: Gloucester ... Salary to £5,600. Ref SA142

SYSTEMS CONSULTANT. At least five years' experience on IBM Hardware and minis. Area: Gloucester ... Salary to £6500, plus car. Ref SA160

SENIOR PROGRAMMER ANALYST. Two years' plus experience RPG II. Area: Exeter. Salary ... Ref. 378

ANALYST PROGRAMMER. At least two years' Cobol. Area: Bridgwater. Salary c £5000. Ref. P277.

OPERATIONS TEAM LEADER. At least three years' ICL 1900 experience with sound knowledge of George III. Area: Wiltshire. Salary c £4.5K. Ref D138.

Please TELEPHONE or write FREEPOST to:

Martins Computer Services, Freepost, Western House, Smallbrook, Queensway, Birmingham B5 4RR
Telephone: 021-643 2111 — 24-hour Answering Service
We are now able to interview until 8.30 p.m. and Saturday ...
Evenings and Weekends 021 ...

OPPORTUNITIES IN WALES & THE WEST COUNTRY

SYSTEMS/COMPUTER AUDITOR

£6300-£6750 (including supplement)

The Authority operates an IBM 370/138 machine with a high speed remote job entry terminal at each of the three divisional headquarters and at Bristol.

This post will be based at Regional Headquarters, Bristol. Duties will include the appraisal of controls within the Authority's financial and operational systems, regular reviews of computer security and participation in the development of new clerical/computer systems and procedures.

Applicants should have extensive knowledge of computer systems and preference will be given to candidates with both programming and accounting experience.

This post carries a regular car user's allowance and relocation expenses will be paid where appropriate.

Application forms, quoting the reference number 354/11 are obtainable from Mr T. Pleass, Personnel Officer, Wessex Water Authority, Wessex House, Passage Street, Bristol, and should be returned no later than 8th December, 1978.

Wessex Water

SOUTH GLAMORGAN HEALTH AUTHORITY (T)
Area Personnel/Management Services Department

SENIOR ASSISTANT
COMPUTER UNIT

Salary: £4421-£5326 (Senior Administrative Assistant). New entrants to the NHS will commence at the minimum of the scale.

The successful candidate will be the second in command in this department. He/she must have had at least three years' programming experience in one or more high level languages, and knowledge and experience of system programming and PDP11 software. As part of their experience applicants should have supervised the design and implementation of at least one major commercial system.

Job description and application form from: Area Personnel Department, 14th Floor, Pearl Assurance House, Greyfriars Road, Cardiff. Tel: 0222 394734.

Informal enquiries to Dr. M. Brown, 0222 20561.
Closing date: 1.12.78.

I.C.L. and I.B.M. Programmers
West Country

We are looking for additional Programmers to join our Group Management Services team at Whitchurch, Bristol, currently operating an I.C.L. 1902S.

The vacancies arise due to an expansion programme which will result in the Management Services Staff moving to a new Divisional Computer Centre operating an I.B.M. mainframe at Shepton Mallet, 18 miles south of Bristol, in 1980. Development is also proceeding on distributed processing applications using I.B.M. Series/1 equipment.

The programmers should have at least 12 months experience in PL/1 or COBOL on either I.B.M. 360 or 370 systems, or 12 months experience in COBOL on I.C.L. 1900 Series.

We can offer salaries within the range £3,000 to £5,000 per annum including supplements, 36½ hour week, four weeks annual holiday, productivity scheme and other benefits normally associated with a large Group. Re-location expenses will be paid where appropriate.

Applicants should write giving brief details of education, experience and present salary to: O. Whalley, Personnel Officer, John Harvey and Sons Ltd., Harvey House, Whitchurch Lane, Bristol BS99 7JE.

Consideration will only be given to direct replies to this advertisement and applications should not be made through agencies.

ALLIED BREWERIES LIMITED

SOUTH WEST UNIVERSITIES REGIONAL COMPUTER CENTRE
UNIVERSITY OF BATH

SYSTEMS PROGRAMMER
NETWORKING AND MULTICS

The Regional Computer Centre is responsible for the provision, support and development of the computer communications network which links five university institutions in the South West and South Wales. The first European Honeywell Multics system has just been ordered and is due to be delivered shortly for installation at the Avon Universities Computer Centre at Bristol. A complex project is in progress to integrate the Multics system into the existing Network, via a bridging system, utilising CCITT X25 international standard protocols. A Systems Programmer is required to complete a small team located at the University of Bath in pleasant countryside just outside Bath. The team is responsible for all the mainframe aspects of the Multics connection; this will entail the implementation of modern high level protocol standards. Previous experience of networking is not essential; knowledge of advanced systems would be valuable. The duration of the appointment will be for two years on the salary scale £1885 ... [illegible]

Further particulars and an application form may be obtained from the Personnel Officer, University of Bath, Claverton Down, Bath BA2 7AY, quoting reference 78/258/CW. Closing date 8.12.78.

TO ADVERTISE YOUR RECRUITMENT SERVICES

Phone: Mark Williams on 01-261 8019

and reserve your space in next week's issue

SOUTH WEST UNIVERSITIES REGIONAL COMPUTER CENTRE
UNIVERSITY OF BATH

ICL 2900/HONEYWELL SERIES 60 (Multics)

ALGOL 68 COMPILER DEVELOPMENT

Vacancies exist for two systems software programmers to join a small team currently developing and supporting the ICL 2900 series Algol 68 compiler, and shortly to start writing a compatible compiler for the Honeywell Multics system. The posts are for a fixed period of two years, providing an exciting opportunity to gain in depth experience of compiler development and support for two sophisticated operating systems to which interactive access is available on local mainframes. A knowledge of either 2900 or Series 60 architectures, and compiler writing or Algol 68 experience would be an advantage, although an ability to learn quickly is of greater importance. Salaries will be in the range of £3303-£4555 (under review) depending on age and experience.

Further details and application forms to be returned by 8.12.78 from Personnel Officer, University of Bath, Bath BA2 7AY (quoting Ref. 78/257/CW).

BRISTOL

SOUTH WEST		SOUTH WALES	
BRISTOL		**GLOUCESTER**	
Sales/Systems Support (OEM)	£12K + Car + Mortgage	Snr Prog/Analy (RPG2)	to £5,750
Snr Anal/Prog		Realtime/Mini	
Analy/Prog (Cobol)	£8,000	Progs	to £8,000
Systems Anal (ICL)	£6,000	Syst Des	to £6,000
Snr Prog (ICL)	£5,500 +	Snr Prog (ICL)	to £5,500
Realtime/Mini Progs	£5-£7,000	Syst Anal (ICL)	to £5,500
Prog (numerous)	£ neg.	Prog (Cobol)	to £5,000
CARDIFF		**HANTS/DORSET**	
Prog (Cobol)	to £5,500	Snr Progs (Minis)	to £6,000
Anal/Progs (IBM)	to £5,500	Snr Prog (ICL)	£5,200
Anal/Progs (RPG2)	to £6,000	Anal/Prog (ICL)	£6,000
Progs (BASIC/ASSEMBLER	to £4,500	Anal/prog (RPG2)	£5,000
		Pro Lead (NCR)	to £8,000
SWANSEA		**SOMERSET**	
Snr Anal (ICL)	to £6,000	Snr Anal/Prog (90/30)	to £6,500
Snr Prog (ICL)	to £5,500	Prog (GIII)	to £5,500
Syst Anal (ICL)	to £5,000	Prog (RPG2)	to £5,000
Prog (Cobol)	£4-£5,000	Realtime Prog	to £6,000
WILTSHIRE		**DEVON/CORNWALL**	
Snr Anal/Prog (RPG2)	to £5,750	Anal/Prog (RPG2)	to £6,000
Prog/Anal (IBM)	to £7,200	Sys Anal (ICL)	to £5,000
Syst Anal (IBM)	to £8,000	Anal/Prog (Cobol)	to £5,000
Pro Mgrs (Realtime)	to £10,000	Progs (Cobol)	to £4,500
Progs (Ass)	to £6,000	Sys Prog	to £6,500
Sys Des (Software)	to £6,000	Prog (PL/1)	£5,000

For further information about any of the above vacancies phone or write to Keith Dawe or Chris Wilson. When writing please enclose your own C.V.

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TELEPHONE 0272 39302

LOOK WEST for

DEPUTY BRANCH MANAGER/ESS
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(OB 95)

SOFTWARE SUPPORT MANAGER
Leading Software House requires highflier to negotiate with large computer users, experience in similar role or with major main-frame manufacturer essential. Bristol or London. Salary package c £12,000 plus car
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with major manufacturer, mini or mainframe experience, HNC desirable. Bristol or S. Wales. Salary £3,800-£4,500 plus Estate car
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ANALYST/PROGRAMMERS
with RPGII esp. several vacancies in progressive installations in Glos, Wilts and Devon. Good promotional prospects. Salaries up to £8,500.

EXPERIENCED COBOL PROGRAMMERS & SOFTWARE DESIGNERS
urgently required for vacancies in the area. *Salaries up to £8,500*

TOMORROW IS HERE: PHONE US NOW
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0272 294196 (24 hour answering)

ANALYST PROGRAMMERS
Western Germany. Salary £20,000 plus

SAC Consultants Limited, a Bristol based company specialising in the supply of high technology consultancy teams to the Aerospace industry, currently require additional ANALYST/PROGRAMMERS to work in Western Germany.
For these positions, no German language experience is necessary.

Our current requirements are for:

a) Analysts to work on design and programming of Software Modules for Real Time Software facility using a Ferranti ARGUS 700 Computer having a knowledge of Ferranti Operating System, together with ALGOL, FORTRAN or CORAL 66.

b) Analyst/Programmers with experience of PDP-11 and RSX System Configuration to work on advanced Space projects.

For further details please write, enclosing brief details or résumé, to:
Philip Watts, SAC Consultants Limited, Brunswick House, Upper York Street, Bristol BS2 8QE.

South Western Regional Health Authority
EXETER COMMUNITY HEALTH SERVICES COMPUTER PROJECT

A rare opportunity to join the 1977 BCS Award Winning Project as a

SYSTEMS ANALYST/PROGRAMMER

Two persons required to join existing team in Exeter developing Real Time and batch computer applications for use in the National Health Service. An ICL 1904A with 128K is the Central Computer with a complex communications system involving the use of VDUs and Termiprinters connected locally and remotely via a 7903 communications processor. Data stored on 10 EDS80 and 8 40Kc/s magnetic tape drives. The configuration has other standard input and output peripherals and runs batch work in parallel with 24 hour real time applications. The Project will shortly start to investigate the development of some applications on mini or micro-computers.

Programming is mainly in PLAN with some COBOL and the real time system uses the DRIVER package. Knowledge of PLAN, DRIVER, or the ICL 1900 or 2900 machine in general will be advantageous.

Appointments will be at either Scale 1 or Scale 4 according to experience. For the higher grade previous systems design experience is essential also ability to communicate with all disciplines and at all levels. NHS experience relevant.

Salary Scales: Scale 1 — £3452 to £4421 per annum
Scale 4 — £4421 to £5328 per annum

New entrants to the Service normally start at beginning of appropriate scale.

Further particulars and application forms from Mr D. Nenke, Administrator, Exeter Community Health Services Computer Project, Royal Devon & Exeter Hospital (Wonford), Barrack Road, Exeter EX2 5DW.

Closing date: 6th December, 1978

ANALYST PROGRAMMER

West Midland Farmer's Association Ltd., is an Agricultural Co-operative with an annual turnover of £30m. They use a 2904 40K running under Exec 1 and JCL. A number of applications are currently being run, and it is envisaged that many more Management Information Systems will be required in the near future. The successful applicant will have a proven knowledge of RPG, preferably gained on a similar machine. A knowledge of COBOL would be an advantage.

Write with C.V. and salary required to: Mr J. D. Canning, Computer Manager, West Midland Farmers' Association Ltd., Head Office, Merchants Road, Gloucester.

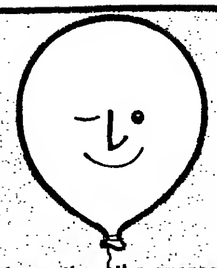
THE — NOT SO WILD & WOOLLY — WEST

Computer growth in the West is, in the main, planned and sophisticated and this of course, rubs off on **your** career. Opportunities not only spread over a wide geographical area but encompass development in the new ranges of ICL, IBM, Honeywell hardware etc. together with the exciting future within the mini and micro world. To sum up, the West Country has a lot to offer you and we have a lot to offer in the West Country.

STOP PRESS
Have you heard the latest news — Bristol is certain to have the new British centre producing mass volume silicon chips for a major microelectronics company (Financial Times 21st November).

If you want to know what opportunities await you Phone:
AB EXECUTIVE (BRISTOL) LTD. CONSULTANTS,
BRISTOL (0272) 426631

Appointments



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MYRIAD

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MIDDLESEX To £9000 + Car

Our client is currently developing several systems involving TP and Audio Response software to run on a network of DEC minicomputers in association with an IBM 370/138 running under DOS/VS.

They are currently seeking an experienced Senior Systems Programmer to be responsible for a small team of technical specialists working in their software and systems section.

This is an excellent opportunity for a senior technical specialist to move into a menagement role, whilst at the same time maintaining a high degree of involvement in software and systems.

Ideally applicants will have a degree level education supported by a minimum of five years' systems and software experience, which should include a sound knowledge of DOS/VS.

The company offer an excellent salary package in the region of £9000 together with company car, a 3% contributory pension scheme and an excellent subsidised canteen.

Ref. E2/2311

PROGRAMMERS

NEW DATAPOINT INSTALLATION

E. LONDON c. £5200 neg.

This is an excellent opportunity to join the newly formed Computer Services Division of a diverse group of companies.

The installation will provide computing facilities for the group and will eventually offer a bureau service to outside users; future plans indicate the introduction of an ARC distributed system. We are seeking two Programmers to augment the team.

Successful applicants will become involved in the development of packages systems and will also work on projects tailored to clients' requirements. Developments will be in both the financial and production areas of commerce and industry.

Candidates' experience should include at least two years' programming gained on minis or small range mainframes. For candidates able to offer considerably more experience than the required minimum the salary will be negotiable. The positions offer good prospects for career development and progression in a very forward looking environment.

Ref. SE4/2311

MYRIAD APPOINTMENTS LIMITED
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Datasolve Datasolve Datasolve

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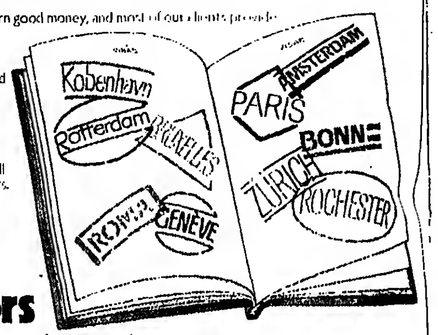
If you stay in the UK we can assure you of a high salary and valuable experience that will put another piece in the jigsaw of your career.
And, although the length of time that your contract lasts is flexible, you'll find that we'll go on working for you for years.



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For further details or advice on these or other **UK** and **European** contracts, call Sue Smyth, June Mogg or Jane Asbury, NOW! on 01-491 4706 or 01-439 3411.

Programmers/Analysts

Immediate/Forthcoming Assignments

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ICL COBOL GII - LONDON
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IBM COBOL DOS - SURREY
IBM COBOL OS - SURREY
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Minimum 2 years FORTRAN+REALTIME Contract to 12 months - BRUSSELS

3 years experience of COBOL. Practical exp. ICL 2980/70/60. Knowledge IBM COBOL. Also IDMS FORTRAN APL PL/1 vacancies - LUXEMBOURG

Please contact Richard Kaluzynski or Suzy Gillam: 01-491 4706 or 01-439 3411.
All vacancies are open to both male and female applicants.

Knight

Knight Computer Services Limited,
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01-491 4706

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Berkshire £4,000-£6,500p.a.

Wescode Equipment Limited are a rapidly expanding company with a market leading product in the field of computerised cheque printing.

We are currently expanding our Systems and Programming Section and need three self-motivated computer professionals to work in some or all of the following areas:

- Pre and Post Sales Support
- Software System Design and Development
- Customer Training

Applicants should have:

- Minimum of one year experience in a D.P. environment
- Demonstrable programming ability
- Willingness to work with a minimum of supervision
- Ability to handle close customer contact

This is an interesting and challenging post, with good opportunities for advancement. A certain amount of overseas travel may be required.

Please write for an application form to:
Systems and Programming Manager
Wescode Equipment Limited
Wescode House
Oxford Road
Newbury
BERKSHIRE
RG13 1PA

WESCODE
WESCODE EQUIPMENT LIMITED

Cambridge City Council

Computer Programmer

Salary AP3/4 £3732 to £4832

An experienced COBOL programmer is required by the City Council preferably with some knowledge of RPG2. It would also be an advantage if applicants had knowledge of on-line systems and of working with an ICL 2903 installation. Duties will include maintaining and improving existing applications as well as developing new systems in line with an overall development plan.

In appropriate cases assistance can be given with housing accommodation, removal expenses, legal expenses, disturbance allowance and lodging allowances.

The authority works a system of flexible hours and staff canteen facilities are available.

Applicants should give details of experience, qualifications, age, together with the names of two referees and should be sent to the City Treasurer, Guild Hall, Cambridge CB2 3QJ, by November 30th, 1978.

Join Data General's Software Professionals

Our Systems Engineering group requires additional software support specialists.

They will be joining a totally committed industry leader who believes in giving clients a professional service from the word 'go'. That's what has made us the world's fastest growing company in the business with more than 50,000 installations world-wide.

Broaden your horizons

You'll be into every type of industry and business . . . commercial Data Processing, on line file inquiry, communications, instrumentation and control and so on. You'll work with advanced compilers and teleprocessing software.

Broaden your knowledge

Data General systems range from microprocessors to the Eclipse M600 with up to 2 MB of main memory — all supported by a vast array of upward compatible system software — ranging from small real time executives to multifunction operating systems — and including a list of programming languages unrivalled on mini-computer systems.

Systems Engineers

You'll provide pre and post sales technical consultancy. Basic Salaries of around £6,000 — and more for really high flyers, plus a Company car and participation in our Incentive scheme. Naturally, we will provide assistance with re-location if necessary.

We'd like to know about your progress to date — and where you see your career going. You must have in-depth experience of software from either an advanced applications or systems programming background. You should have the personality to get on with clients and be able to talk commercial problems with them.

You'll be working from Manchester, Birmingham, or London. If you're a Systems Analyst with your feet firmly planted in one boring spot — this is the ideal opportunity for you to consolidate your career experience.

Trainee Systems Engineers

Maybe you don't currently fit the specification exactly — but even so, if you have the potential and are currently aged 23-25 years, we'd be keen to talk to you.

The next step

Telephone Janet Field on 01-572 7455 for an application form — we will be conducting formal interviews with selected individuals at the venue below. Alternatively, if you would prefer an informal interview simply call at our suite during compec and we will be happy to supply further details.

We are at the Royal Garden Hotel, Kensington High Street, London W8. December 5th/6th/7th.

Data General

Data General Limited, 3rd and 4th Floors, Hounslow House, 724-744 London Rd., Hounslow, Middlesex, TW3 1PD. Tel: 01-572 7455.

JUNIOR OPERATORS

...THIS COULD BE YOUR CHANCE TO MAKE THE GRADE.

SIX MONTHS Operating experience on any mainframe is the qualification necessary for these positions. We are particularly interested in those who feel cramped by the inadequacy of their current hardware and, despite only being involved in the industry for a short space of time, are looking to move into an installation of advanced technology and outstanding career prospects.

Our client offers a fully operational ICL 2980 under the control of VME/B operating system and making extensive use of database and teleprocessing facilities. It is a highly sophisticated operation, one of the most advanced you are likely to find.

With a continuing effort to substantially improve the systems, our client can confidently predict a high degree of job interest and a continued career path.

Starting salaries will be in the range £3000-£3500 plus SHIFT ALLOWANCE. The operation is based on a Social TWO-SHIFT system and additional benefits include NON-CONTRIBUTORY PENSION SCHEME, 4 WEEKS' HOLIDAY and SEASON TICKET ADVANCE. The Location is CENTRAL LONDON within easy access of Public Transport. For further information and immediate appointment for interview contact REF: MT/380 at:

D.P. RECRUITMENT LTD.,
KENT HOUSE, 87 REGENT STREET, LONDON W1R 7HF.
TEL: 01-437 2062/3/4 (24-HOUR ANSAPHONE)

RECRUITMENT/ SALES CONSULTANTS

LINSCOTT Computer Systems Limited

Salary + Commission £10k + Nr. Brentwood, Essex

As an expanding computer consultancy and recruitment bureau, we currently have openings for 2 professional men or women.

One position calls for the placing of permanent staff, whilst the other for the procurement of contracts. The successful applicants will each be responsible for a defined area, servicing existing clients, both on a personal basis and by telephone. The ability to negotiate and win new business is called for. Duties will also include interviewing candidates, promoting advertising scheme to clients and maintaining records of Staff.

It is essential that candidates have previous computer knowledge gained either in Operations or Systems Programming. Preference will be given to those with a sales background, but this is not essential.

We offer an excellent salary and commission plus other fringe benefits, which includes expenses.

For more information or to arrange an interview write to or telephone: Stephen Trigg, Linscott Computer Systems Ltd., P.O. Box 74, Brentwood, Essex CM15 0B2. Telephone: Brentwood (0277) 212021.

BRENTWOOD (0277) 212021

Computer Operators Senior Operators

Come in at the beginning of a massive new expansion programme.

We'll give you the Grand Tour

We're holding a series of informal discussions at our modern complex in Wyvern Way, Rockingham Road, Uxbridge on Monday 27th November and Tuesday 28th November between 6 pm and 8 pm. You can come along and ask us about the vacancies we have to offer. We'll give you the Grand Tour and take you round our computer room where we have a very advanced installation consisting of 2 ICL 1930T's, 1 IBM 3031 and 1 ITELL AS5 (roughly equivalent to an IBM 370/158). We are keen to meet people who have something to contribute to our progress as well as their own.

Our basic requirement is for Computer Operators who have a minimum of 12 months' experience on ICL or IBM equipment and Senior Operators who have at least 12 months' Senior Operator experience or at least 3 years' total DP experience. We are also interested in meeting Data Control Staff.

In addition to the basic requirement we are looking for people who can apply innovative thinking to their duties and who can become genuinely involved in the total structure of the company.

This is the finest time to join us as we are at the start of a big and important expansion programme – we'll tell you more about this when we see you on Monday or Tuesday. We'll also give you full details of our constant training programme – almost unique in this business – which means that you never lag behind and are always up-to-date with the very latest techniques and methods.

Informal Interviews

Remember you will not be putting yourself under any obligation whatsoever. Come along between 6 pm and 8 pm on Monday 27th November or Tuesday 28th November – it is simply a chance to get to know more about GRIP.

If you really can't make it but would like to know more, write to or telephone Miss P. Donoghue, Personnel and Training Officer, GRANDMET INFORMATION PROCESSING LIMITED, Wyvern Way, Rockingham Road, Uxbridge, Middlesex. Tel: Uxbridge 58111.

GRIP
the computer power behind Grand Met.

SENIOR PROGRAMMERS
PROGRAMMERS
to £5000
Newcastle upon Tyne

Our Newcastle based client, a well known International Company, wishes to recruit additional programming staff.

* Minimum 12 months COBOL any machine
* Salary to £5,000 depending on experience and qualifications
* Good staff benefits
* Relocation expenses
* Good career prospects

Contact Ivor Norton quoting reference c/78097 to arrange a discussion at a convenient location.

Ivor Norton Management Services Ltd
Recruitment Consulting Division
62 Shaftesbury Avenue, London W1V 7DE (01 734 8862 (24 answering service))
P.O. Box 63, Copthall Tower House, Harrogate HG1 1TS. Tel: 66628

TEST ENGINEERS.

Computer Systems

We have a number of vacancies for test engineers with experience of digital electronics on computers and a knowledge of software.

Applicants, who could at present be working in a systems house or with a computer manufacturer, will become involved with fault finding, general testing and on-site commissioning of sub-assemblies and systems for message switching and other communications applications.

An attractive salary and prospects are offered to the right applicants, who will be based at our pleasant premises at Uxbridge.

Please write or telephone:

Dennis West, Managing Director
Computer Electronics Limited
Unit 6, Longridge Way
Cowley Mill Road
Uxbridge Middlesex
Telephone: Uxbridge [0895] 30878

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PROGRAMMERS + ANALYST/ PROGRAMMERS
£5000 - £6500

COBOL - RPG - PL/1 - ASSEMBLER

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Vacancies exist for people with varying degrees of experience in the above areas.
If you are seeking a position nearer your home, please telephone for an application form.

AMES PERSONNEL
Employment Agency Suite 16, Dryden Chambers, 119 Oxford Street, London W1R 1PA. Tel: 01-434 1060

COMPUTER ENGINEERS

Due to rapid expansion we now require the following personnel:

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to assume responsibility for installation, maintenance and repair of our existing Key-to-disc, Distributed Process and Real-time computer systems, and our future products.

There are immediate vacancies in the Central London South Croydon and Sussex areas.

Applicants should ideally have two years experience with mainframe or mini computer systems.

The company offers an attractive salary plus a company car together with the usual benefits.

Please telephone (reversing charges) or write to:

Colin Minns — 01-686 8545

CMC Computer Machinery Company Limited
38/40 Sydenham Road Croydon, Surrey

16 Bedford Row
London WC1R 4EB
01-242 9356
Telex 21120

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● Contracts

MUNICH 12 Months +

A mejor Germen computer menufacturer requires e Senior Consultent with sound knowledge of IBM System 3 Softwere. The succeesful candidote will edvise on the development, implementation end conversion of systems bssed on System 3 Herdwere. Involvement with e mejor conversion exercise end experience of System 370 Software, would be en edventege. An understanding of Germen would elso be useful.

AMSTERDAM 6-12 Months

Our Client is the second lergest Software house in Hollend. At the present time, they requiro systems softwere progrsmmers with IBM OS/OOS end/or MVS experience. Sound knowledge ol ASSEMBLER is essentisl — other lenguege experience could be usoful.

S. EUROPE 12 Months +

A Consultent is required in Southern Europe for en initiel period of 12 months, to provide support end guidence in the development, enhancement, end implementetion of banking eystems on Honeywell L64 herdwere. Communications end Networking experience, together with e good working knowledge of GCOS would be ideal. Involvement will be mainly et the applications level.

SPAIN 12 Months +

A Technical Consuftent is required for e project location in Spein. Applicents should heve in-depth experience on Univec 1100 including e sound working knowledgo of the DMS 1100. Networking experienco end e background in benking would be particularly relevent for this position, es the Consultent will be expected to provide eupport in both technical end applications ereas. The successlul cendidete will interfece with e teem ol enelysts end programmers in an English speaking environment.

TEXAS USA 6 Months +

Opportunities exist ot progremmer end consultancy levels lor candidetes with Honeywell 6000/level 6B experience. Programmers should heve et feast 4 years' COBOL experiance including some time spent on Honeywoll equipment. Consultents should heve et least 8 years' experience including o thorough knowledge of detabase techniques. For ell eppointments, experience ol IOS, TOS, TSS or GMAP could be very uselul. Selsry and working conditions ere excellent.

Remuneration packages lor all contracts will be sttractive. Bass salarios will be tex free or will include tax concessions. For further informetion or informal discussion, please contscl Roger Allington. **Rof: FL3/CW/RA.**

● Croydon

Programmer/Analyst

to £6,000 plus car

Minsler Automation market TIGER, e telephone msnagemcnt system (Telephone Informstion Gethering lor Evaluation ond Review) end ere the market leedeis in this field. They sre looking for an experienced COBOL progremmer, to join the small leem who instell their softwere peckeges throughout the UK and investigete end specify clients' lurther requirements. Home-bsse will be Croydon. There will be opportunities for trsvel to Europe at e leter dete.

If you like meeting people end would enjoy the chsllenge of helping end sdvising e variety ol users — IBM 360/370, ICL 1900 end 2900, Honeywell, Univsc, Burroughs — plesse contact **Joen Ainsworth** quoting **reference 749/CW.**

● Enfield

Programmer

c£5,400 + Co. Car Scheme

There is e requirement for e progrsmmer to join Polyline, a progressive menufecturing company with retail outlets both et home end ebroed. Existing computer herdwere is en IBM System 32 which is to be repleced by e Syetem 34 early noxt yesr. Thore ere e few commerciel systems now running snd it is our client's intention to computerise es much of the company's administretion es possible. As the data processing department is quito small, there is e certein emount of floxibility ns far os dulios aro concerned end the progrsmmer, if willing, will bo oncouraged to get involved with the enelyticel reseerch as well.

It is essentiel thet cendidetes should heve et leust 12 months programming experience. Training will be givon in RPG II. Tho ebility to communicete is en obvious oeset. Company bonofits include e subsidised steff resteurent, profit shering, e compnny car echeme and relocetion esaislence if required. **Ref: 750/CW/Marian Tabone.**

To apply for eny of the ebove positions or for further information, please telephone the Consultant concerned during working hours on 01-242 9356 or write to tho above address.
If it would be more convenient to telophone in the evening, or at weekends, the telephone numbers are:
Roger Allington — Berkhamsted (044 27) 2299 — Marian Tabone — 01-555 5558.

Members of Computing Services Association

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Madagascar

Our client ie e succesful European organisation opereting vertically integrsted textile mills in various parts of the World. Candidates for this challenging opportunity muet have experience of working with multi-programme lenguages such as RPG and COBOL and be conscious ol the importance of establishing end meintaining clesr and precise programme files covering all ol the mill's computer requirements. These include financiel sccounts, weges, selee, production control and stock end order control lor s manufacturing unit employing approximately 3,600 people. The main frame used ies Honeywell series 62 level 40 with e contrsl unit of 148K. The succeeslul applicent will be fluent in both epoken and written French and the attractive terms include free housing and many other lringe benefits, in eddition to s generous remuneration.

Please telephone 021-822 3838 for en application form et eny time, or send full personal and career details to John L. Overton, F.C.A., OVERTON MANAGEMENT SELECTION LIMITED, Moneco House, Bristol Street, Birmingham, B5 7AS quoting reference 2/1108.C.W.

Applications are welcomed from men and women.

OVERTON MANAGEMENT SELECTION

As a result of internal re-organisations and promotions within the Computer Division of the Borough Treasurer's Department, the following additional or consequential vacancies have arisen

Principal Project Leader

Salary up to £6,987 p.a. Ref. B 269

Responsible for all aspects of computer systems development from feasibility study to implementation and review stages including the overall control of all systems and programming staff allocated to a project. Successful applicants will be expected to have undergone formal training and ideally possess a University Degree and/or BCS/NCC qualifications together with considerable experience in computer systems and programme development thus possessing the ability to lead a multi-discipline team.

Senior Systems Analyst

Selary up to £5,853 p.a. Ref. B 361

To work as part of a project team or independently except for general guidance by the Project Leader on computer systems development and maintenance. Applicants will be expected to have undergone formal training and ideally possess the NCC Basic Systems Certificate and have had at least three years' computing experience.

Programming Team Leader

Selary up to £5,853 p.a. Ref. B 268

Experienced programmer, minimum five years, conversant with COBOL required to supervise small programming team and to support Project Leader in the systems development and maintenance of computer systems. Knowledge of PLAN would be an advantage.

Senior Programmer/Analyst

Salary up to £5,358 p.a. Ref. B 364

Programmer with knowledge of COBOL and 2-3 years experience required to assist in controlling small programming teams and deputising for Programming Team Leader in his/her absence.

Systems Analyst

(2 POSTS)

Salary up to £5,358 p.a. Ref. B 276/7

Required to assist in the design of computer systems and undertake some projects on own initiative under the general direction of Project Leader or Senior Systems Analyst.

Computer Operator

Salary up to £3,994 p.a. inclusiva of e Shift Allowance (Dar at £3,556) Ref. B.309

Required as a member of a team responsible for running the Council's computer under the direction of senior staff. Training would be provided to applicants without relevant experience.

THE INSTALLATION consists of an ICL 1903T 96K Computer (being upgraded to 128K shortly) with EDS 60's and M/Tapes running under George 3 Operating System which supports an on line VDU and MOP service during prime shift together with the batch processing and a remote job entry Key to Disc data preparation service.

THE WORK involves the development of both on-line and batch systems and the whole concept of future development plans and future hardware requirements is currently under review with the possibility of introducing database management techniques.

STARTINO SALARIES will be commensurate with age, experience and qualifications up to the maximums quoted. In regard to the Computer Operator post progression beyond £3,556 p.a. is dependent on duties performed and efficiency of the officer.

ADDITIONAL BENEFITS INCLUDE:

- Floxible working hours
- Excellent annual leave conditions, up to 26 days for the Senior appointments
- Assistance with relocation expenses
- Interest free rail ticket loans
- Canteen facilities
- Social Club

LOCATION — BROMLEY is an outer London Borough, primarily residential, situated on the fringe of the green belt and Kent countryside.

Closing date 13th December, 1978

Application forms from Assistant Chief Executive (Manpower), Town Hall, Bromley BR1 1SB. Tel. 01-464 3333, ext. 3318. Further information regarding duties, etc., available from Assistant Treasurer (Computer) Tel 01-464 3333, Ext. 3348.

LONDON BOROUGH OF BROMLEY

COMPUTER PERSONNEL APPOINTMENTS LTD.
Career Specialists and Consultants for
D.P. MANAGERS, SYSTEMS ANALYSTS, PROGRAMMERS AND OPERATORS
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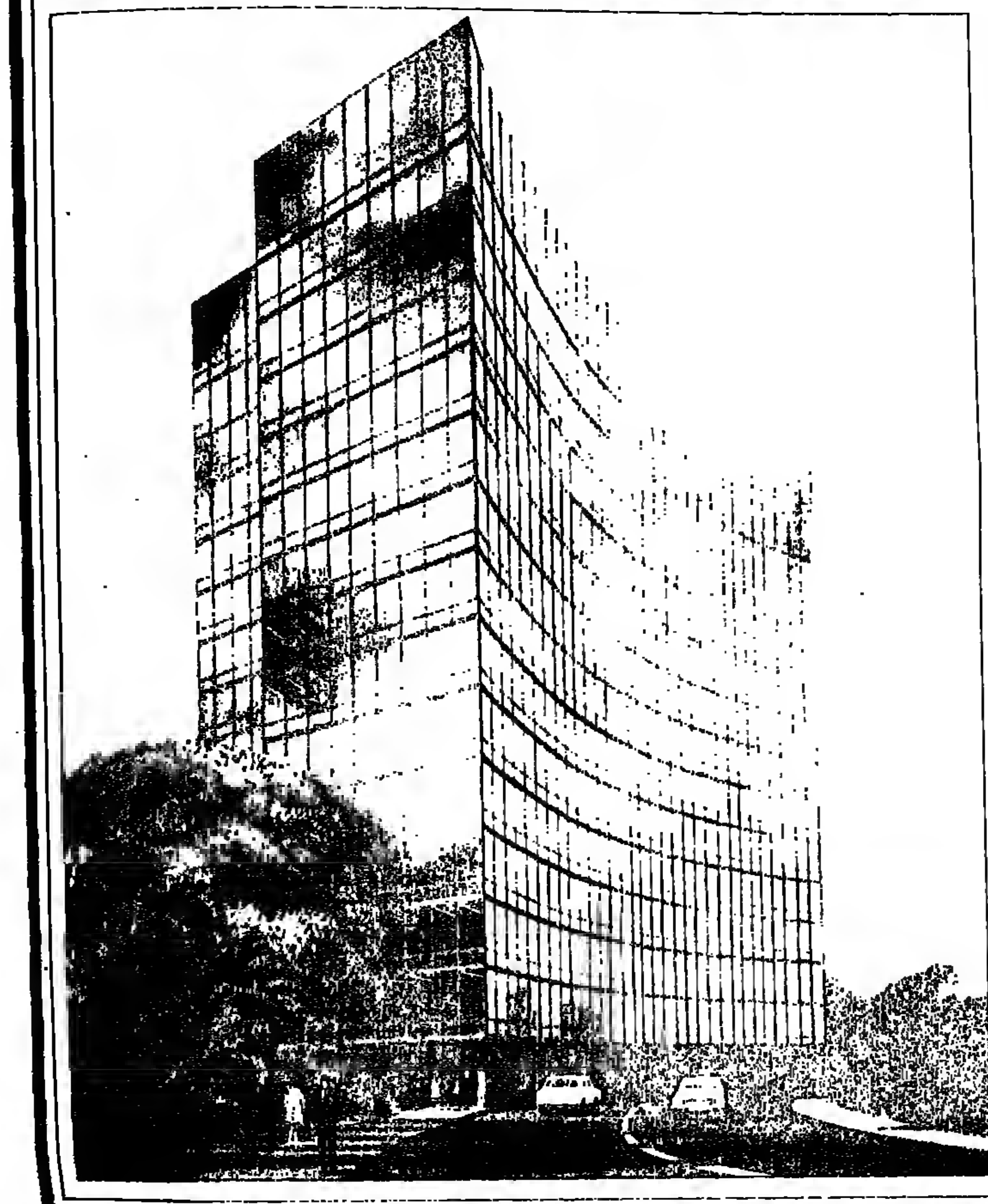
For registration forms apply to:
85 New Street, Birmingham B2 4DU: 021-643 [illegible]
or Tel: 01-320 7251



Zurich Insurance UK Head Office located at

PORTSMOUTH, HAMPSHIRE

International Insurance Group requires imaginative and enthusiastic DP personnel (male or female) for computer operations and for existing and planned project teams engaged in the development and maintenance of a wide range of Insurance systems involving both on-line and batch applications.

We presently operate a one megabyte IBM 370/148 under VM/370 and DOS/VS using CICS, CMS and DL/1.

SYSTEMS ANALYSTS

£5000 – £6000

3 years analysis experience in a commercial environment, preferably with a background in programming and some experience of DB/DC applications.

PROGRAMMING STAFF

up to £5000

Cobol experience essential; some on-line experience would be an advantage.

SHIFT LEADER

c£3750 + 20% Shift Allowance

IBM 360/370 operating experience; preferably already leading a shift. 3-shift, 5-day week basis.

For all positions full training will be provided to meet both immediate job requirements and to aid future career development.

Excellent fringe benefits include:-

- ASSISTED MORTGAGE SCHEME (no qualifying period)
- GENEROUS RELOCATION ASSISTANCE
- NON-CONTRIBUTORY PENSION SCHEME (including free Life assurance)
- FLEXIBLE WORKING HOURS (with the exception of Shift Leaders)
- MODERN OFFICES WITH SUBSIDISED STAFF RESTAURANT

Write giving career details to:
C. F. Nash, Staff Manager,
Zurich Insurance Company,
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Stanhope Road, Portsmouth PO1 1DU.
Tel: 0705 22200 (Ext 3166)

ZURICH INSURANCE

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Mini computers are one of the most significant advancements in Data Processing, being utilised in many spheres of industry and commerce.

An International Mini Manufacturer, offering both Real Time and Batch facilities, are developing a range of hardware and software equipment to satisfy the needs of their expanding client base both in the UK and overseas.

Features of their hardware and software have resulted in an expansion rate of 40% per annum, creating opportunities for:

PROGRAMMERS TO £6,500
with:
*Minimum 12 months commercial or scientific programming experience with either low or high level language capabilities.
*Enthusiasm, ambition and the ability to develop and contribute to a small dynamic team.

PROGRAMMERS TO £9,000
with:
*Minimum 2½ years commercial programming experience with either high or low level language capabilities.
*Management potential and the ability to liaise with senior management, more importantly the desire for responsibility.

These positions offer total project involvement, very good promotional prospects and excellent salaries based entirely on merit: Please telephone Valerie Hall: 01-935 0671

SCR
SPECIALIST COMPUTER RECRUITMENT LTD.
LONDON 01 935 0671 FREEPOST
3 Mandeville Place, Wigmore Street, W1M 5LB.

Computing Services Association

Analysts & ogrammers

R-R now set to cash in on TriStar

ROLLS-ROYCE and Lockheed, whose partnership was pushed into the background by last week's Boeing deal, could soon be monopolising the headlines again with their own multi-million pound deal.

The opening of Farnborough Air Show yesterday gave both companies the opportunity to re-affirm their unique relationship centring on the TriStar jetliner.

With the announcement last

Tony Attwater at Farnborough

Trans World Airlines of America are evaluating the long-range TriStar. The

£1,300m 3-NATION ORDER FOR 165 MORE TORNADOES

By Air Cdre E. M. DONALDSON, Air Correspondent

AN order worth £1,300 million for 165 more Tornado multi-role strike aircraft is to be signed by the Governments of Britain, Germany, and Italy.

This will bring total orders from the three countries to more than 500 aircraft, now worth

Big order for Olympus power

An £11 million contract for two quad Olympus electrical generating sets has been placed with our Company by the Ce

R-R ...um ...lade ...iled

By ... Science Editor

A Boeing and Rolls-Royce Farnborough coup

FOR the last four or five Farnboroughs most airliner debate has been about replacing 3,000-odd short-haul twin jets. In an eye-of-show coup which surprised even themselves, Boeing and Rolls-Royce—with the support of Europe's biggest short-hauler, British Airways—gave the first answer: the Boeing 757 with RB.211-535s. Not Jet, ATMR, X-Eleven, A200, ASMR, Mer-

Whatever the balance of the card has been played least the British came clea They did not, in order to ge Airbus bed, falsely conceal were bespoken to Boeing.

We must now look to t accentuating the positive apart, the positives are: (Aerospace the company re

Cabinet gives approval for Boeing airliner fleet deal

Government permission for British Airways to buy about 21 American Boeing 757 airliners powered by a new version of the Rolls-Royce RB211 engine is expected to be announced today.

'Vital boost' to future of Rolls-Royce

It's all systems Go at Rolls-Royce

The success of Rolls-Royce must make good reading for anyone with professional, technical or specialist skills. It is the outcome of technical innovation, design and manufacturing excellence, plus adherence to high standards in every sphere of operation, backed by aggressive sales and marketing.

For the computer specialist the impact of all this is perhaps more subtle. It clearly requires a much increased emphasis on computer based design, control and information systems in order to mount the highly complex design and manufacturing programmes needed to power the aircraft, ships and plant of tomorrow. But less obviously it also creates that all important buoyant climate where new thinking and projects can thrive in a well motivated atmosphere.

In short, it represents what must be one of the largest and most promising range of DP opportunities offered for some time. To Programmers and Analysts of various specialisations and levels of experience it is the chance to join a thriving company and work in a sophisticated environment backed by technical resources and personal development programmes respected world-wide.

Opportunities occur in most Aero Division locations which include Bristol, Coventry, Derby, Glasgow, Watford and at Industrial and Marine Division, Ansty, near Coventry. Installations and control software are as follows:-

Bristol IBM 370/168 & 158's, CDC CYBER 74, DEC 10; MVS, IMS
Coventry IBM 370/138; SVS, CICS.
Derby IBM 3033, IBM 370/168's; MVS, TSO, IMS.
Glasgow IBM 370/145; SVS, ROSCOE.
Watford IBM 370/138; DOS/VS, CICS.
Ansty COUPLED ICL 1900's.

Now consider where you could use your talents to the best advantage.

Manufacturing & Business Systems

Manufacturing

In this area you could be working on systems dealing with bill of materials, order capture, materials requirements planning, shop scheduling, process planning, inventory control, stock control, tool scheduling and their procurement and stock control, quality and non-conformance. Or you might be concerned with the advanced fields of computer aided production engineering and manufacture. Project teams are also expanding our purpose-built Material Requirements Planning systems into new areas. Others are developing our range of on-line facilities, currently covering functions as diverse as purchasing and shop control.

Product Support

This area is concerned with providing customers with a service that matches the design excellence of the engine in accuracy and reliability. Its major effort is to give our customers an on-line interactive service to supply spares and within this system, to ensure that the service is backed by good forward planning and procurement.

Systems are also being developed for improving the monitoring of engine performance in service, and to provide customers with data for more efficient engine handling. Computer control is also being used in the production of maintenance and overhaul manuals and other technical literature.

Finance and Personnel Administration

The accounting systems already mounted in both cost and financial accounting areas are being continually enhanced and integrated with other fundamental area systems. The field of Production Costing, for example, where advanced work-in-progress systems, and new procedures for paying our suppliers are being installed or developed. We are also looking at plans for accounting systems for aero engine development work, sales and marketing and factory operating statements.

Developing systems for manpower requirement planning, the control of all phases of recruitment and training and the administration of complex wages and salary structures are the key areas in Personnel Administration. The analysis environment is one of close co-operation with users in order to mount on-line interactive systems. A knowledge of data base systems is clearly useful together with an appreciation of the human factors and industrial relation problems involved.

Engineering Systems

In engineering, the major thrust in the scientific use of computers is to generally enhance the design function (CAD) and to establish mechanised aids for the draughting stage through to manufacture (CAD/CAM). The control of build and test of development engines and analysis of test results is another area where systems are being further developed.

The major effort with engineering business systems is to record and control the configuration and specification of the gas turbine engine so that designers and development engineers can improve and speed up the design/development process. The behaviour of these engines once in service is monitored and analysed by systems in support of our design engineers in their task of ensuring that optimum performance levels are maintained.

Analysts and programmes ... to work on scientific applications must have an engineering, mathematical or scientific background as well as ... computing experience.

Data Base Systems

Many of our application ... mes now operate off data bases accessed by both local ... note terminal networks. Our on-line application syst... being developed so that the daily transaction volume ca... eased five-fold over the next two years–to the level ... 00 transactions.

This specialist area requi... ledge of all aspects of IMS/DL1 data base design ... tenance, IMS systems management, and transacti... systems design.

Applications Programming

The main focus of current ... ture development in Aero Division is directed at using ... major business systems, and for some time now TSO ... used extensively for Engineering scientific system... also as a programming tool. Industrial and Marine Division ... equivalent development strategy. PL/1, Cobol and Fortran ... the main languages.

To complement our systems ... teams, application programmers are used in teams ... translate the particular business specification into ... ned suite of programs over which they retain respo... for support throughout the life of the system. Four ... s are devoted solely to supporting Numerical Control ... tions throughout the Company.

Systems Programming

To develop, implement and ... n manufacturers' and in-house software we have ... most sophisticated teams in Europe engaged in ... our complex environments.

Our software and hardware ... ed to extreme loads generating a fascinating spec... oblems for solution by the specialist. Bigger CPUs ... and have been ordered. The workload is growing ... the TP network.

Our Remuneration Policy

As a high technology bu... ward our people well for high performance through ... award system in addition to annual salary re... erous relocation package is also available ... sidered reasonably priced in most Rolls-Royce ...

Check out your 1979 prospects NOW

Please tick your job interest(s), preferred area(s) and location(s) and indicate the main frames and systems you have worked under, then return, by FREEPOST - you don't need a stamp - to:

John Buckingham, Personnel Department, Rolls-Royce Limited, FREEPOST, 65 Buckingham Gate, London SW1E 6AT.

JOB INTEREST		AREA	
APPLICATIONS PROGRAMMING		MANUFACTURING	
SYSTEMS PROGRAMMING		PRODUCT SUPPORT	
SCIENTIFIC PROGRAMMING		ENGINEERING	
SYSTEMS ANALYSIS		FINANCE & PERSONNEL ADMIN	
DATA BASE SPECIALISTS			

LOCATION(S) PREFERRED: ANSTY ☐ BRISTOL ☐ COVENTRY ☐ DERBY GLASGOW ☐ WATFORD ☐

COMPUTERS & SYSTEMS USED CW/4 | PROGRAMMING LANGUAGES USED

NAME (MR/MS) | ADDRESS

AGE

TEL. NO: DAY | EVENING

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★ **OPERATIONS ANALYST** To £6,000 ★ **SHIFT LEADER** c. £5,500 ★ **OPERATOR** c. £4,700

The computer operations department of this international bank is situated in London. Two large IBM mainframes are being operated under DOS/VS with POWER/VS and CICS/VS.

Candidates must be able to demonstrate a sound knowledge of **at least** two of these software functions. In each case current experience in the relevant position is essential.

Work satisfaction is assured, with several new projects shortly to be implemented, together with extensive hardware upgrades. In addition excellent career opportunities and extensive training programmes exist for ambitious applicants who wish to extend their knowledge and expertise.

Excellent company benefits include:

- ★ Low interest mortgage facility
- ★ Non-contributory pension plan
- ★ Free medical and life insurance
- ★ Profit sharing
- ★ Subsidised meals
- ★ Subsidised travel

To hear more about these opportunities —

PHONE NEIL ARMSTRONG ON 01-603 7335

IPP Information Processing People

58 Pembroke Road, London W8. Telephone: 01-603 7335/6. Telex: 261298
Computer Services & Recruitment Consultants.

JBA

Programmer Technicians
Surrey — **Start to £6,900 + BUPA or £9,000**

This company specialises in the provision of conversion services to installations changing or upgrading their hardware. They require COBOL technicians, particularly those with UNIVAC or HONEYWELL level 66 experience, who enjoy programming and wish to keep in touch with the most modern ideas and equipment. Candidates already at a Senior level will be considered for Project Leader positions, with salaries c £8-9,000.
Their Richmond HQ services both the UK and Europe, so after initial training you may well find yourself spending short periods on the Continent supported by generous tax-free allowances on top of your salary. If you relish the idea of travel and variety, and look forward to a technical career, you may fit in to this exciting environment.
First class training and promotion opportunities, relocation expenses and free life and health insurance. **Contact: Andy Wright**

Programmers
West End — **Up to £7,400 + benefits**

A leading overseas banking group require programmers at all levels with a minimum of one year's COBOL experience, ideally gained on IBM 370. The installation handles a number of financial applications including an on-line system for foreign exchange.
The bank offers traditional fringe benefits including a very low mortgage scheme after a settling-in period which, together with low interest loans, represents a valuable package. Very pleasant working environment and flexible approach to those who can use initiative and accept responsibility.
Contact: Mike Creamer

Analyst/Programmer
Home Counties — **up to £7,500**

Our client, one of the largest software houses in Europe, wishes to recruit an Analyst/Programmer to work on the development of accounting/financial applications.
Applicants should have at least two years experience as a programmer using high level languages followed by a year involved in the design of applications or packages. Ability to liaise with clients/users would be a positive asset.
Excellent salaries in a professional environment. Generous fringe benefits including a bonus. **Contact: Jim Baker**

Software Lecturers
Herts — **Up to £6,500**

This computer manufacturer, a subsidiary of a large engineering conglomerate, requires the services of two additional software lecturers to train its customers in the use of its software products, especially operating systems of advanced design. Applicants should have at least two year's experience in the industry and preferably some instructing background.
Fringe benefits include a performance related payments scheme and the possibility of running courses overseas. **Contact: Mike Creamer**

Support Programmer
Herts — **to £6,000 + car**

This client has a vacancy for an experienced ASSEMBLER level programmer, preferably with at least eighteen months involvement with minis or micros, who wishes to move into sales/client support.
The company is a highly successful small firm, employing roughly 30 people and with a turnover of £1 million plus, specialising in customising micro-based intelligent terminal systems for applications ranging from Data Entry to Communications Networks.
Once the initial training period is complete, the successful candidates will progressively become more involved with clients and their requirements, designing and writing systems decided with them.
Superb opportunity to join a young and growing company – car provided.
Contact: Andy Wright

Customer Support Staff
NW England — **to £6,000 + car**

Due to continuing success in the North West a leading company in the computer time-sharing business need to increase their customer support team. The team is responsible for a growing customer base; work content is varied and interesting. Therefore the right candidates will have the ability to quickly grasp new concepts and to express themselves lucidly. Previous experience in time-sharing is an advantage although not essential since all applicants will benefit from an intensive formal training. There are positive opportunities for growth in the company in technical and managerial areas.
Contact: Margaret Stevens

**For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.**

**JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478**

Sales Executives
Income £14K +
YOUR NEW DAY DAWNS!

Unrivalled opportunities exist within a US based Mini Computer Manufacturer with an eye on the future. Their advanced technology makes them market leaders in their field – where they go, others follow. They have a substantial customer base in the Commercial, Industrial, Scientific and Technical sectors of the market.

The Company have vacancies for Sales Executives to operate in established territories throughout the UK.

We are looking for successful MINI Computer Sales Executives with a proven track record to join a highly professional sales team, with excellent technical and engineering support.

The Company offers above average conditions of employment, excellent base salaries and commission package plus a company car and relocation expenses will be paid where necessary.

Initial interviews will be held in London, Birmingham and Manchester.

If you are interested in working in tomorrows world, contact without delay:
Richard Champion on: 021-236-3781 (24 hour answering service)

SCR

SPECIALIST COMPUTER RECRUITMENT LTD.
Birmingham 021-236 3781 Freepost, Equity and Law House, 35-37 Great Charles St., Queensway, Birmingham B3 2BR

BRUNEL UNIVERSITY

LECTURERS IN COMPUTER SCIENCE

Applications are invited for the above posts (2) from candidates with a good honours degree and research or industrial experience in computing. Preference will be given to those with experience in one of the following areas: operating systems; data processing, systems analysis, data bases.

The posts are to be filled as soon as possible.

Write for application form and further particulars to the Assistant Secretary (Establishment), Brunel University, Uxbridge, Middlesex UB8 3PH, or telephone Uxbridge 37188 extension 49. Closing date: 15 December, 1978.

IBM 370

O.S. PROGRAMMERS & ANALYSTS
HOME COUNTIES £5.5-£7.5K p.a.

[illegible]

Senior Appointments £8-9K p.a.
Other Appointments £5-£6K

[illegible]

MATRIX

Telephone 01-491 4636 (10 Lines)
300 Oxford St. London W1N 9RA.

INTERACTIVE COMPUTING
Rutherford Laboratory

The Engineering Board of the Science Research Council is setting up a national Interactive Computing Facility. Based on a network with major nodes at Chilton, Edinburgh and Manchester, the computing equipment includes a twin-processor IBM 360/195, two DEC 10's, a Prime 400, a GEC 4070, a III FR80 colour microfilm recorder and numerous other computers and peripheral devices. Several more multi-user minis will be purchased this year and added to the network.

Systems Programmers

You will be joining a small team engaged on designing, writing and updating systems software for multi-user mini-computer systems. The main areas of work include communications software associated with the network, software for a range of graphics devices and enhancements to the operating systems, utilities and compilers.

Depending on qualifications and experience, grading and salaries will be as follows:

Scientific Officer	£3,037 – £4,724
Higher Scientific Officer	£4,388 – £5,829
Research Associate (fixed 3 year term)	£5,500 – £8,000

We are prepared to offer accommodation and the posts are based at the Rutherford Laboratory, Didcot, which is situated within pleasant rural surroundings on the Berkshire Downs.

We provide daily travel facilities to most of the neighbouring towns and villages, and Rutherford has its own restaurant and recreation facilities, while at the adjoining AERE Harwell Site, you can enjoy the full benefits of the shops, banks, sports and social clubs.

Please write for further details and application form, quoting reference number VN7 55 to Ruth Jeans of the Personnel Group.
Closing date for applications: 8th December 1978.

RUTHERFORD
Science Research Council
Rutherford Laboratory, Chilton, Didcot, Oxfordshire OX11 0QX. Tel: Abingdon 21900

Hertfordshire
c. £7,000

IBM 370, CICS/VS, DOS/VS, VSAM

Programmer
with 3 years COBOL experience in a DOS environment. Some ASSEMBLER would be additional advantage.

Systems Programmer
with 2 years ASSEMBLER/COBOL, ideally with DOS/VS and VSAM.

These are the type of people our client would like to meet and talk to about the two senior positions he wishes to fill.
He is the Data Processing Manager of a large company whose products are almost household names in most Western countries, and he controls a DP division committed to new and extensive systems development over the next few years utilising 370 hardware in a real time environment. He can offer *you* real opportunities for extending your knowledge and experience to fit the changing demands of the 1980's. He can offer an excellent starting salary, pension scheme, free life assurance, subsidised lunches and other meals in the company restaurant, valuable discounts on the purchase of the company's products, relocation expenses where appropriate, and freedom from commuting, AND a progressive career.

TO APPLY
Please send immediately a ONE PAGE handwritten or typed list of, name, address, age, home and office telephone numbers, relevant programming experience, hardware and software exposure, present position, employer, salary, previous employment, to ANTHONY SPURR, Management Recruitment Division, quoting reference number G670. Please indicate on the reverse side of your application those companies to whom you would not wish your application to be sent directly. All applications will be answered promptly. Applications are invited from people of either sex.

**or Why not telephone now?
Watford 32861, quoting G670**

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UT
Telephone 01-633 0866

BIS Applied Systems

OPPORTUNITIES FOR SOFTWARE PROFESSIONALS

IN MINI AND MICRO SYSTEMS

UP TO £9,500 PER ANNUM

INFORMAL INTERVIEWS AT OUR HEAD OFFICE:
Pembroke Broadway, Camberley

From 17.30-21.00 hours on Tuesday, 28th November, 1978

SYSTEMS DESIGNERS LIMITED

Systems Designers Limited is a professional organisation having total systems and software capability. To help meet the continuing high demands placed on these services, a considerable number of professional staff are required at programming and engineering levels.

We are therefore holding informal interviews in our new offices in Pembroke Broadway, Camberley on 28th November from 17.30 to 21.00 hours. We will be pleased to welcome anyone interested in learning more about our company and the rewarding careers offered.

If you can meet the challenge of intellectually stimulating and varied work with a leading well-established software and systems consultancy specialising in mini and micro computer real-time applications, then please drop in for a drink and chat with our managers and consultants. The office is adjacent to Camberley Railway Station.

If you cannot make it, telephone Bill Hockey, our Operations Director on Camberley (0276) 62244, or write to him at:

SYSTEMS DESIGNERS LIMITED
SYSTEMS HOUSE
1 PEMBROKE BROADWAY
CAMBERLEY, SURREY GU15 3XH

Current growth areas of the company include:

Communications — Emulators, Message Switching, Telex Systems, Communications Management Systems, Computer Communications.

Industrial — Process Control and Monitoring, Plant Control Simulation, High Speed Data Analysis.

Military — Modelling, Avionics and Radar Systems, Complex Rigs, Simulators, Microprocessor Missile Systems.

Software Products — Compiler Technology, Software Design Techniques, MASCOT, Information Processing Systems.

Consultancy — Complex Military Systems, Software and Systems Development Technology

All areas of involvement are supported by specialist consultants

Systems Designers controls the career progression of its staff to give them a wide variety of experience, both of project applications and of computer systems.

Applicants should have a good academic background and at least one year's computing experience.

The requirements are for Programmers, Engineers and Consultants.

SENIOR ANALYST PROGRAMMERS

c £7,000 p.a. + BENEFITS

CREATIVE OPENINGS IN THE HEART OF THE WEST END

One PDP 11/70 is already installed — another two will be added soon because of sustained growth. Enjoying the financial support of their parent public company, this thrusting young subsidiary are now looking to augment their applications team with two experienced professionals.

You will be able to demonstrate your abilities to take a brief from marketing and transform this into a tangible product. In addition to your technical competence with BASIC, you will have the creative flair necessary to handle users from the advertising and publishing worlds.

In the future, this experience could lead to exciting turnkey projects, with your commercial software being installed on users' own PDP 11s.

Promotion on merit in a young and growing company will ensure that successful candidates will be able to enjoy a stimulating, rewarding environment for the foreseeable future.

Phone GEOFF MARSH on 01-499 4501 for more details.

RW 47/4

SALESMEN

Do you want a career with a Company —

— that offers you the opportunity to sell mini-computer systems that meet the needs of today's commercial user and are in widespread use throughout the UK and the world?

— that involves you in the burgeoning market for systems providing dispersed intelligence?

— that supports you with a generous level of systems back-up?

— whose management will inspire your confidence?

— that provides you with an attractive performance related income package and a company car?

If you do want all these things, you are a successful salesman already, and preferably live to the North of London, you should contact me — TONY BAKER — on 01-499 4501 **NOW.**

Ref. RW 47/5

Excellent opportunities and **interesting work** available for

Analysts and Programmers

Real Time Analyst/Programmer

required to head a small group working on real time processing of radar data for military radar systems. Must have at least two years' experience in real time mini computer/micro-processor field, writing in assemble language together with a high level of language such as CORAL. Some knowledge of the electronics of interfacing would be an advantage. Age 24-35 years.

Argus Programmers

required to develop real time programs, using CORAL/MASCOT, for real time signal processing. The successful applicant will possess 2/3 years' experience in this field and be in the range 22-40 years.

Scientific/Engineering System Analyst/Programmers

required for real time and microprocessor systems analysing and processing Radar Video. Must have previous experience of microprocessor work and a mathematical background; using Coral/Fortran and/or T1990 or POP 11 Assembler.

Scientific/Engineering Programmers

required for Software design and coding for microprocessors, TEXAS T1990 series. Must have experience of using Coral/Fortran and/or T1990 or POP 11 Assembler.

Suitably qualified and experienced candidates are invited to write to or telephone:

G. A. Betts, Decca Radar Limited, Davis Road, Chessington, Surrey KT9 1TB. Telephone: 01-397 5281

DECCA — *The Queen's Award for Export Achievement to Decca Ltd 1976*

SOCIAL SCIENCE REBEARCH COUNCIL
RESEARCH UNIT ON ETHNIC RELATIONS
COMPUTER PROGRAMMER/ STATISTICIAN

Required by a multi-disciplinary research team working in the housing field, a computer programmer/statistician to work closely with a Research Associate at Manchester University. The appointment will be for one year. Salary within the range £3384-£8665, depending on qualifications and experience.

Applications with curriculum vitae and the names and addresses of two referees should be sent to Mr. R. Sims, c/o Department of Sociology, University of Manchester, from whom further particulars can also be obtained. Closing date 8 December, 1978.

CLASSIFIEDS

CICS Analyst Programmer. O.S. or DOS with either COBOL or Assembler experience. Central London based, salary dependent on experience to £7,250. Financial systems background preferred but not essential.

COBAL 68 Systems Designer for 6-8 months. Park Royal contract. Rate from £200 p.w. PDP-11 background an advantage. Software or technical preferred.

ITALY. Permanent or Contract. If you have any DEC experience using either OS/RSX or RSTS our client wants to meet you soon. Salary negotiable but seriously high.

DENMARK — IBM DOS and/or Unisys 1100 COBOL applications exposure required for early January, 1979, start. Prefer permanent career person but consider contract.

AUSTRALIA. Applications and Systems Programmers for career positions in Sydney, Melbourne and Perth. IBM, Honeywell, ICL, DEC and DG experience preferred.

OXFORDSHIRE. Micro specialists (Intel 8080, Z80, Z280) required by multi-national franchise holder. Recently formed U.K. company which can offer outstanding career positions. Salaries to £10,000.

BRUSSELS. T.P. and O.S. Applications and Software Programmers. Prefer DEC software. Full relocation expenses and tax rates at least averaging Benelux added salaries. to £18K. Interviews at our London office.

MATRIX

DP Training Sales Consultants

London and Manchester

Remuneration up to £8,000 plus car

We are looking for DP professionals with training experience, sales talent and the ambition to progress in an expanding organisation.

The consultants' objectives will be to sell and support the Company's training services through direct contact with DP management and training officers.

The role will encompass selling and consulting. It also offers excellent prospects for wider responsibilities in a leading DP Management Consultancy.

Please phone, for Personal History form, or write enclosing C.V. to Derek Potts, Manager, Training Division, quoting reference number G680. Applications are invited from both men and women.

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UT
Telephone 01-633 0866

BIS Applied Systems

PL/I PROGRAMMERS

to £7,500 p.a. + RELOCATION (KENT) + BIG COMPANY BENEFITS

A new generation of Real-Time message switching technology is being employed to radically change public and private telecommunications systems throughout the world. Each customer's requirement of this new technology is different from the next and thus the products used need to be flexible.

To create this flexibility, high level software is being developed to translate customer requirements automatically into a packaged product. At whatever level you join this project, you can be confident of adding to your expertise in a rapidly expanding market sector.

TEAM LEADERS
with around four years' experience, preferably with some exposure to large projects, proven supervisory ability and an appreciation of Systems Design.

PROGRAMMERS
Competent individuals with upwards of one year's PL/1 experience, capable of working on your own initiative on sophisticated systems with enough ability and ambition to warrant early promotion to senior posts in the near future.

Please call GEOFF MARSH on 01-499 4501 or Garston 79536 outside office hours.

Ref. RW 47/6

hutchinson-scoggins recruitment
47/48 New Bond Street (entrance in Maddox Street) London W1Y 0HE Telephone 01-499 4501

One programme that's not moving wavelength

Because we're on the right wavelength already, at Swanley, Kent.

Our programme of rapid expansion means interesting, varied and rewarding development work and a deep involvement for analysis and programmers at the very nucleus of our expanding group operation.

The International Group with 20,000 employees means many things. It means the Superstore division with 8 Superstores already in existence and many more planned for the future. It means recent acquisitions like Wallis Supermarkets and Alliance Wholesale Grocers. It also means Kearley & Tonge, one of the largest catering distributors and Pricerite, opening stores throughout the country. And of course, there are the many large and small International Supermarkets.

For every one of these – and our other future plans – we will need the expertise and knowledge to devise the variety of systems and programmes for our many operations. This will mean visits to new locations and a perpetual source of new and exciting projects to get immersed in.

To handle this expansion programme, we are building up our team of programmers and analysts at Swanley, Kent.

The hardware consists of an IBM 370/145 512K operating under DOS/POWER/CICS/VS with 40 VDUs, using the latest stock control package INFOREM. And future installations include on-line IBM Series 1, Minis and IBM System 34. A knowledge of COBOL Language would be a distinct advantage.

Programmers to £6000 pa.
Ideally we would like to hear from programmers who see themselves as analysts in a few years. But if you have about two years' experience of programming and feel ready to take on new responsibilities, we would like to hear from you.

Analysts £6500 pa.
You will be involved in many interesting areas of analysis and be required to design systems for the entire network of the International Group. This will mean visits to a wide variety of locations from 32,000 sq. ft. superstores to busy quick turn-round depots.

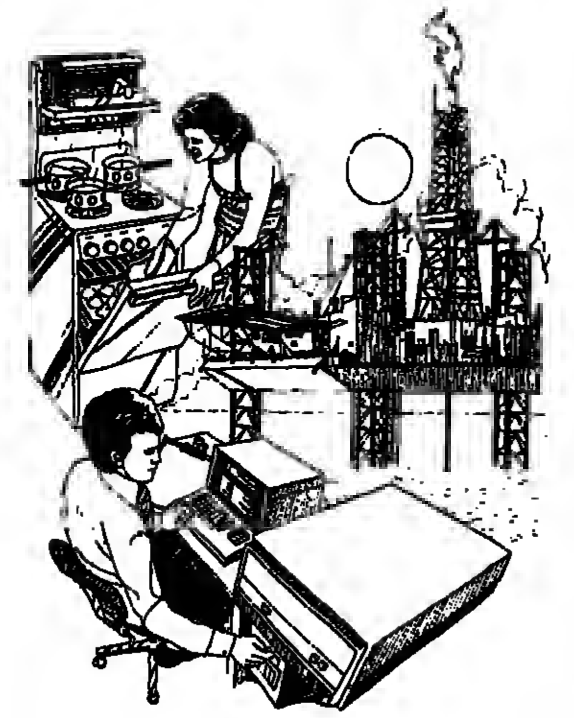
Here's a unique opportunity to gain valuable experience with International in a lively and friendly atmosphere. Find out more. Contact our Personnel Officer, Joan Leigh at International Stores, Goldsel Road, Swanley, Kent. Tel: Swanley 65533.

Our programme at International is one of expansion. It's a programme that's on the right wavelength – YOUR WAVELENGTH

Member of BAT
INTERNATIONAL

COMPUTER OPERATIONS MANAGER

to be involved in Minicomputer Development in West London



up to £8457

North Thames Gas is developing a Customer Service computer system to achieve further improvement in the standard of service to our customers. It is to be a real time system running on Data General C330 minicomputers, with over 60 V.D.U.s.

We are looking for a Computer Operations Manager, male or female, who will be responsible for the management of the computers and associated equipment at our Development Centre in Acton, and for the setting up of minicomputer installations at operational sites within North Thames Gas.

You should have a graduate or professional qualification or equivalent and several years' relevant experience in Computer Operations including at least two years at a senior level of responsibility.

Experience of minicomputer hardware, communications networks and computer environments could be an advantage.

Salary is in the range of £7182-£8457.

For an informal discussion ring David Taylor, Computer Manager (Minicomputers) on 01-993 1014 or write to him making an application form unnecessary at this stage and quoting reference E9103 at North Thames Gas, Minicomputer Development Centre, 233-239 High Street, Acton W3 9DB.

NORTH THAMES GAS

CLEVELAND EDUCATION COMMITTEE
HARTLEPOOL COLLEGE OF FURTHER EDUCATION
Principal, C. C. Doram, BSc, MInstMC, Cert Ed

APPOINTMENT OF
LECTURER GRADE I
DEPARTMENT OF BUSINESS STUDIES (COMPUTER STUDIES)

SALARY SCALE - £3192-£5334

Applications are invited for the above post with duties to commence on 1st January, 1979, or as soon as possible thereafter.

The person appointed will be required to teach Computer Studies to courses throughout the College. Commercial and/or industrial experience and experience with micro-computers are desirable.

Further information and application forms may be obtained from the Principal, College of Further Education, Stockton Street, Hartlepool, Cleveland, to whom completed forms should be returned within 14 days of the appearance of this advertisement.

The Tower Hamlets Health District
THE LONDON HOSPITAL (WHITECHAPEL)

COMPUTER OPERATORS

Operators are required to participate in the efficient operation of Univac Mainframes. Current applications include real-time patient management, resource allocation, radiology and clinical pathology services. Operators will carry a large measure of responsibility and will be heavily involved in user support, liaison and general troubleshooting.

Salary for Basic Operators – £4301 p.a. rising by 5 annual increments to £4964. Intermediate Operators – £4936 p.a. rising by 7 yearly increments to £6237. Both grades are inclusive of shift allowance and enhanced payments for weekend duties.

For further details, 'phone Sylvia Lyons or Les King, up to 8.00 p.m. each evening, or write with brief career details to: Modem Computer Services Limited, FREEPOST, London WC2N 5BR. 01-839 3351.

Freelance Contracts **MODEM** **Permanent Positions**
Consultants in Data Processing

SYSTEMS DESIGNERS LIMITED

Advanced Systems Technology to £10,000 per annum

If you have more than five years' experience in Real-Time Computing Systems working in multi-discipline teams and are prepared to question traditional approaches to

- Requirements Specification
- Systems Analysis
- Design
- Software Testing
- Quality Control

you may be eligible to participate in exciting projects aimed at developing methods and tools needed for computing systems development in the 1980s.

We currently have a number of vacancies for professional staff with the right outlook and ambitions. If you think that you can respond to this challenge please apply to:

Bill Hockey, Operations Director,
SYSTEMS DESIGNERS LIMITED,
Systems House,
1 Pembroke Broadway,
Camberley, Surrey
GU15 3XH
Telephone: Camberley (0276) 62244

REAL-TIME

MINI & MICRO REAL-TIME PROGRAMMERS
SOUTH EAST & EEC

You've probably got an excellent job right now – exciting, rewarding and where you are appreciated ... genuine promotional prospects ... you? You could be falling behind ... in salary terms but in software ... and hardware development ... a Mini or Micro processor ... programmer, Systems designer ... with good Assembler ... then consider joining the ... software division of our international ... client where you will be ... develop your ... opportunity ... contribute your expertise in a highly motivated and innovative ... experience you will be valued ... rewarded and ... in a ... manner where every effort ... suit your preferences and ... Salaries will be scaled ... experience and potential ... by industry standards.

U.K. SALARIES: £6,000-£ ...
EEC SALARIES: £8,000-£ ...

MATRIX

MANAGEMENT & EXECUTIVE SELECTION

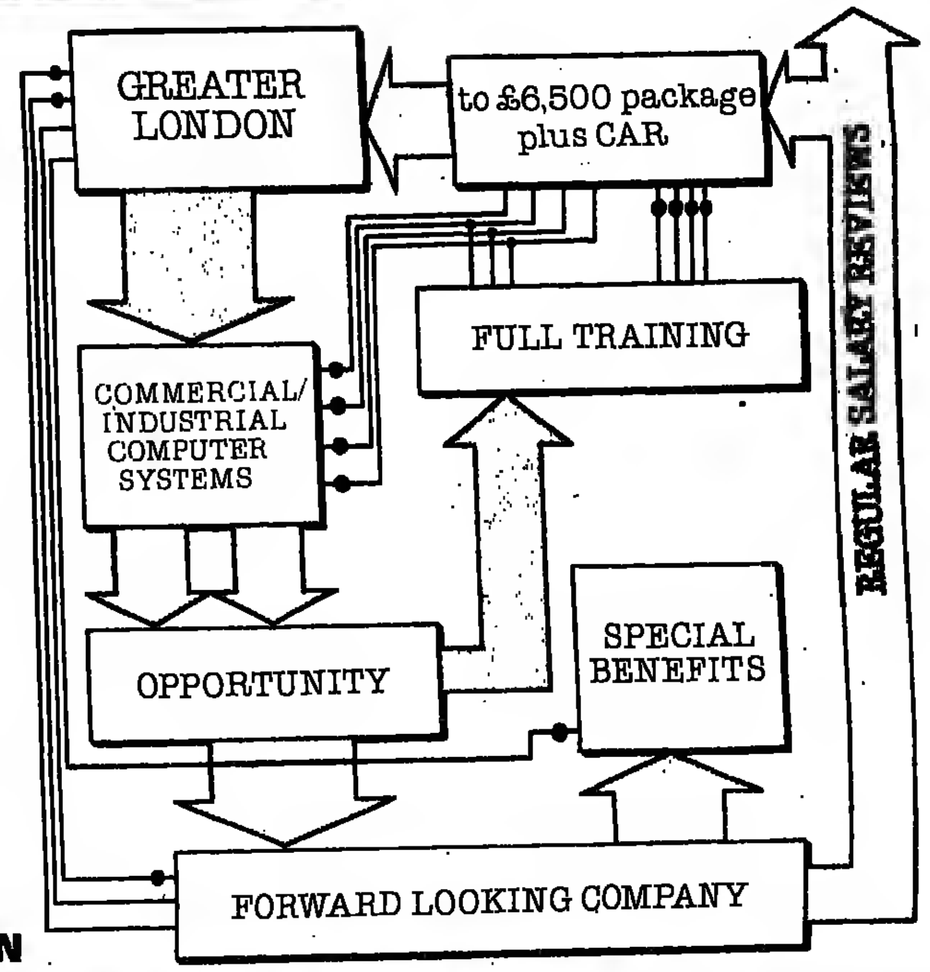
telephone 01-637 9611

FIELD SERVICE ENGINEERS

<u>SALARY PACKAGE:</u> To £6,500 package + Car
<u>AREA:</u> Greater London
<u>EXPERIENCE:</u> Practical experience of computer systems in industrial/commercial environments is required.
<u>OPPORTUNITY:</u> The U.K. Division of this multi-million dollar American company is small but established, and with sales at an unprecedented high, they expect to double in size within five years. Thus career progression is virtually guaranteed.
<u>TRAINING:</u> Full training will be provided at the company's European Training School on a regular basis.
<u>FORWARD-LOOKING COMPANY:</u> The company manufacture powerful mini and micro computers for industrial/commerical use. Their success has resulted in over 18,000 systems installed world-wide. Always at the forefront of technological advances, their activities are constantly highlighted in the International and Trade press.
<u>SPECIAL BENEFITS:</u> Free BUPA, Free Life Assurance, Contributory Pension Scheme (5% of salary), 20 days' Holiday p.a.

For positive career advancement, contact Peter Gorton

Suite 201/6, Albany House, 324 Regent Street, London W1R 5AA 01-637 9611 **MANAGEMENT & EXECUTIVE SELECTION**



PROGRAMMER ANALYST (Eire)

Tara Mines Ltd. is the largest lead and zinc mining and milling operation in Europe. Production commenced in mid-1977. We offer challenging career prospects and excellent job opportunities at our Navan Site.

A vacancy has arisen for a Programmer Analyst within our Data Processing Installation.

Applicants should have at least four years' commercial experience in programming and design and be qualified to make an all-round contribution to systems, programming, implementation and training. Previous involvement in timesharing, screen data entry/file enquiry, etc., in a mining or manufacturing environment would be an advantage. Our current systems are written in COBOL and RPG.

Salary scale, working conditions and benefits for this position will be excellent, and can be discussed in detail at interview. Application forms, which should be returned not later than 6th December, 1978, quoting reference number CW/160, may be obtained from:

John Kennedy,
Personnel Manager,
Tara Mines Ltd.,
Knockumber,
Navan,
Co. Meath,
Eire.

TARA

JBA

Project Manager

Central London **to £9,000**

A requirement has arisen for an experienced Project Manager to take responsibility for systems development of a Sales and Stock Accounting project in the operating company of an extremely large and diverse manufacturing group. The company is currently developing an extensive range of both real-time and batch distributed database systems, based on a network of PDP-11/70's and an IBM 370/138.

Applicants must have depth of experience in project management commensurate with the ability to control a major development project and a team of highly motivated professionals.

This is a positive opportunity to work for an excellent organisation where career prospects and the employment package are both considered to be above average.

For further information on the above vacancy, please Contact: Margaret Stevens.

JAMES BAKER ASSOCIATES
International Personnel Consultants
16 Maddox Street, London W1
Tel: 01-491 4478

AMBITIOUS OPERATORS (Promotion minded)

WEST LONDON to £4620 (incl.) + BENEFITS

A well-known Record Company has two operator vacancies due to internal promotion. One with 18 months +, and the other, 12 months +, experience. This installation comprises two large IBM mainframes running under DOS/VS, POWER/VS + CICS, with ONLINE systems, supporting 70 local + remote terminals, and plans include use of minis. The senior post will have IBM 370 experience using DOS or DOS/VS, and a real chance to promote to Shift Leader later. The operator will have 12 months' experience under DOS, and will join a young, enthusiastic team.

BENEFITS are numerous. They include EASY ACCESS from most areas, a comprehensive TRAINING Program, non-contractual BONUS, SUBSIDISED CANTEEN, Sports and Social Club and CHEAP RECORDS

COMPUTER CONSULTANCY

TO £7000 + PROFIT SHARE

A Major Computer Consultancy is looking for programmers who want to work in a Multi-Project Environment on Development work. Languages mainly are PL/1, COBOL, BASIC + RPG II. Working with young professionals can only benefit your technical skills and speed your progress. Benefits are incomparable. — 6 Monthly Reviews, Profit Share, Travel Expenses, free BUPA, plus Relocation Assistance where necessary

PROGRAMMER

SOUTH COAST TO £5,5K + BANKING PERKS!

A well-known Factoring Firm running a large IBM mainframe, is seeking a programmer with up to three years' COBOL and/or ASSEMBLER experience, to join their ten-strong systems and programming team. The benefits are worth considering since they are consistent with Banking. They include CHARGE FREE Bank Accounts, LOANS at preferential rates (after a period), and, similarly, a beneficial HOUSE-PURCHASE SCHEME, as well as various INSURANCE SCHEMES all at preferential rates

370→3033 ASSEMBLER PROGRAMMERS

To £5,500 + Mortgage Rural Surrey

Our clients, already a disciplined and innovative user of IBM technology are taking delivery of an IBM 3033 in mid-1979

In anticipation of this and other developments, they now have a limited number of vacancies for competent Assembler programmers.

This genuine career opportunity also offers a non-contributory pension scheme, immediate and generous subsidised mortgage, excellent lunching facilities, flexitime, and a Sports and Social Club on site.

MAINFRAME COBOL?

GO D.E.C. MINI AND TRAVEL!

Our client is a prestigious manufacturing group based in S W 1

They require an 18 month + experienced Cobol or Fortran Programmer to provide group companies with the necessary expertise to help implement new installations and systems based on D.E.C. mini computers.

Machine background is irrelevant but a [illegible] is not

Benefits are unparalleled, offering a salary NOT LESS THAN £5,000 A COMPANY CAR, EXPENSE ACCOUNT ETC., ETC. and a real respect for your talent

TO £7350

NEW UNIVAC V7.7

SYSTEMS SOFTWARE TECHNICIAN

SURREY

PROGRAMMER ANALYST/PROGRAMMER

LONDON (CITY) TO £6,000

One of Britain's major Software Houses currently has vacancies for a Programmer and Analyst Programmer to join a small progressive team working on DEC PDP 11's. Applicants should have a minimum of 2½ years' programming experience with a good knowledge of BASIC +

These are extremely exciting opportunities for anyone seeking variety and career progression. Attractive salaries plus fringe benefits are the rewards offered to the right people

CHIEF PROGRAMMER

ESSEX c. £7,300

A leading manufacturing company based in rural Essex is currently seeking a Chief Programmer to complement their expanding Data Processing Department. At present it comprises an IBM 370 running under DOS/VS, with a large Teleprocessing network

Applicants, who should have around eight years Data Processing experience must have a sound knowledge of Cobol and Assembler, together with teleprocessing experience. Project leadership ability is essential. This is an extremely dynamic and responsible position which requires a mature person with a strong desire to progress rapidly within D.P.

LEADING OPPORTUNITIES IN RETAIL

Our client, one of Britain's leading retail organisations, is currently embarking on major expansion which will last into the 1980's. With a substantial investment in new hardware, they are now seeking to recruit Programmers, Analyst/Programmers and Systems Analysts at all levels. On the programming side a good knowledge of either IBM or ICL COBOL is essential. Salaries are extremely attractive, as are the benefits offered by this forward moving company.

NORFOLK PROGRAMMERS/SYSTEMS ANALYSTS

SALARY: V. NEGOTIABLE

Our client is currently expanding its D.P department and has a requirement for several Programmers and Analysts to join their Software team. The relevant qualifications include a sound knowledge of ASSEMBLER and/or PL1, previous working experience on commercial and/or financial systems would be most advantageous although not essential, ambition and self-motivation together with a good standard of education, preferable to a Degree level. Suitable applicants will be well rewarded by working in pleasant rural surroundings for a dynamic organisation that offers VERY NEGOTIABLE SALARIES plus a FREE RESTAURANT, twice yearly BONUSES, company PENSION SCHEME and RELOCATION assistance where applicable

This is a chance not to be missed! Contact us NOW for more details

BERKSHIRE SOFTWARE PROGRAMMERS

SALARY: V. NEGOTIABLE

Our Client is a large Engineering organisation who is currently recruiting staff for its Software Department

The necessary qualifications are a proficiency in one of the following languages COBOL, FORTRAN and/or BASIC, to a minimum of 3 years, plus ambition and self motivation

The location is convenient for public transport and is easily accessible by road from London, Oxford and Surrey

The salary is very negotiable and creates no obstacle for the right candidate. For more information on these marvellous opportunities contact us now!

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SALARY TO £6000 + BENEFITS

A number of interesting vacancies have recently become available in this large, well known commercial organisation.

Openings occur in the Programming and Systems Section for experienced COBOL Programmers, preferably with approximately 3 years on the NCR series. For the more Senior posts, duties will include leading a small team, training of Junior Personnel and solving any problems or queries, making this an excellent opportunity to enter a progressive company, if you are ambitious and self motivated.

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- applications software, particularly business packages
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We are seeking a self-reliant marketing oriented person with the flexibility to understand customers' problems and operate in a sales environment. The likely age range is between 25 and 30 years and the ability to speak French or German would be an advantage. Salary is negotiable to £8500 per annum and an attractive range of benefits including a non-contributory pension scheme, free membership of BUPA and an annual bonus is provided.

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United Kingdom

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PROGRAMMERS N. London	PL1. High level software for a new generation of real-time message switching.
PROGRAMMERS S. Beds.	Production Control PL1, DOS/CICS, three months starting mid-December.
FINANCIAL ANALYSTS Midlands/N. London	Accounting background and ability to communicate at Board level essential.
PROCESS CONTROL Various Locations UK and Holland	Programmers for Digital Control Systems. Assembler/Basic. DEC PDP II, RSX II.

Abroad

PROGRAMMERS, BANKING & INSURANCE Germany	Several requirements throughout Germany for good OS — COBOL — ICL.
DATA BASE Amsterdam	IMS/IDMS in depth knowledge for software engineering project. 18 months.
PROCESS CONTROL SOFTWARE Holland	Digital Control Systems. Assembler Basic, PDP II, RSX II.
IBM MAINFRAME PROGRAMMERS Europe	Good OS/DOS/CICS knowledge required. Immediate start.

Call BRIAN DAWSON on 01-499 4501 for more details of these and other contracts.

If you are thinking of becoming a contractor in Operations/Programming/Analysis Hutchinson Scoggins Contracts Limited will be pleased to assist and advise you.

Ref. RW 47/1

OPPORTUNITY IN BANKING FOR CAREER-MINDED

PROGRAMMER/ANALYSTS

LONDON — £7500 + MORTGAGE

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These individuals will have a proven OS COBOL background, analytical ability and the supervisory skills necessary to head up a small team soon after joining.

These openings represent one of those rare opportunities to progress rapidly in a rewarding environment with career opportunities both in and out of data processing.

If you think you can command the package mentioned, call me GEOFF MARSH on 01-499 4501 NOW

Ref. RW 47/2

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Ref. RW 47/3

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WEDNESDAY 29 NOVEMBER

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Opening for all levels of D.P. professionals within this highly regarded technical consultancy specialising in on-line, real-time, message switching and network applications using Minis and Microprocessors.

Assembler level programming experience on Mini/Micro computers is of primary importance and ideally candidates should have a degree in Computing Science or related arees.

Candidates must be genuinely enthusiastic about the prospect of settling in Holland for an extended period. All removal expenses, initial accommodation, etc., will be met in full by our clients. Interviews will be held in London as soon as possible and offers will be made to successful applicants within 2 weeks following interviews.

Ref. 47/1

HAVEN HAVEN HAVEN HAVEN HAVE

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Interviews will be held throughout December.

Ref. 47/2

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Ref. 47/3

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Ref. 47/4

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Ref. 47/5

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SYSTEMS ANALYST

Brussels — to £12,000

A British Consultancy based in Brussels urgently requires a Systems Analyst with COBOL/RPGII knowledge on an IBM 370 DOS/VS. It is highly desirable that the applicant has banking/communications experience for this highly rewerding and stimulating position. Relocation expenses will be paid in full. Please state whether you prefer your interview in London or Brussels.

Ref. 47/6

ANALYST/PROGRAMMERS

London — to £6,500

The systems engineering division of one of the UKs most successful computer service companies invites applications from Analysts/Programmers having at least three years' experience of assembler-level programming on either mainframes or minis. At least one year should have been spent working on Real-time applications, communications or compiler development. Ideally candidates should have knowledge of more than one manufacturers hardware.

Ref. 47/7

INFORMATIX UNITED KINGDOM AND OVERSEAS INDEX

Haven Informatix Limited

24 Grays Inn Road London WC1X 8HR Telephone 01-831 6055 Telex 299539 HAVEN G

The THEOREM group is a specialist IBM software house with offices in Birmingham, Yorkshire and Hertfordshire. We have achieved and are extremely proud of our reputation for designing successful computer systems. THEOREM is now embarking on a controlled expansion and requires highly motivated professional staff to assist us in the future.

THEOREM COMPUTING SYSTEMS require experienced analyst/programmers with skills in designing and implementing computer systems for business applications. It is essential that applicants are familiar with RPG II and the small business computers in the IBM range. All successful members of staff enjoy a variety of applications and a wide range of staff benefits including car allowances, profit linked bonuses and above average salaries. Location will be Birmingham and Huddersfield with a certain amount of travel.

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For early interview please telephone Hatrix as soon as possible.

MATRIX

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Ref. E1723T

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informatics inc

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London WC2B 6AL
01-405-8546

Computer Department

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Successful applicant will subsequently be trained in Series 1 and PL/1 and must be prepared to travel.

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Essential: PL/1

Desirable. Series 1 or IBM 360/370, Assembler, Systems programming experience.
Good French. Probably some travel.

Conditions for both posts. Salary £5000+. Good leave. Subsidised restaurant

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Kidsgrove is situated in the pleasant rural setting of North Staffordshire. A wide variety of housing is available and we'll help you move.

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These positions are open to both men and women.

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The Computing Services Unit provides a central batch and on-line service, based on a 64K ICL 1902T with EOS60s, Communication and Graphics.

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Staff with mathematical or engineering background are required to join a development team working in the field of group technology, machine loading and work scheduling. The programming language principally used is Fortran, but experience with other languages would be an advantage.

The work is interesting and varied and involves close liaison with industry in the application of advanced principles of production systems design and operation.

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Please send full details to Manager, Production Technology Systems Department, PERA, Melton Mowbray, Leicestershire LE13 0PB. Tel. Melton Mowbray 4133.

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Applications giving relevant details to:
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360 Euston Road
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The applications involved will be Batch and On-Line systems.

This position offers excellent fringe benefits and the opportunity to play an important role in the DP Department. The successful applicant will report directly to the D.P. Manager.

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OPERATORS

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IBM DOS	SNR OPS	£5500	3 SHIFTS
IBM DOS	OPERATOR	£4000	3 SHIFTS
IBM DOS	JNR OPS	£3700	3 SHIFTS
ICL GIII	SHIFT LDR	£5500	3 SHIFTS
ICL GIII	OPERATORS	£4400	3 SHIFTS
ICL GII	OPERATORS	£4300	2 SHIFTS
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We offer excellent prospects, competitive salary dependent on experience and qualifications and a subsidised staff restaurant. Write for application form quoting ref. AC15 (C.W.) to The Secretary at the address below:

BNF Grove Laboratories, Denchworth Road, Wantage, Oxfordshire OX12 9BJ

THE RANK ORGANISATION

SHIFT SUPERVISOR to £5,430

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This is primarily a SUPERVISORY position and the successful applicant will be responsible for the complete administration of their shift and will also be involved in Recruitment, Appraisals, Standards, etc. Therefore it is an ideal opportunity for a Senior Operator, or Shift Leader, with at least 4 years' Operations experience gained in a DOS environment and with some supervisory expertise. Career prospects are excellent and this challenging position will enable them to develop their managerial skills as an important member of a highly efficient operations team. A three shift system is in effect covering the normal working week of Monday to Friday.

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For further information and an application form please contact:

COMPUTENT

14 MOUNT PLEASANT TUNBRIDGE WELLS KENT TELEPHONE: TUNBRIDGE WELLS 35712/3/4

UNIVERSITY OF SALFORD
DEPARTMENT OF MATHEMATICS

SCIENTIFIC OFFICER/RESEARCH ASSISTANT

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Scientific Officer
Salary ORIA £[illegible]-£6555

Research Assistant (one year) -
Salary ORIB £3984-£4382

Further particulars and application forms may be obtained from the Registrar, University of Salford, Salford M5 4WT, to whom completed applications should be returned by 7 December, 1978, quoting ref. M/156/CW (Informal enquiries to Professor J. B. Copas Ext. 885.)

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THE NORTH E. WALES INSTITUTE OF HIGHER EDUCATION
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SCHOOL OF MATHEMATICS, STATISTICS AND COMPUTING

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(WITH PROGRESSION TO SENIOR LECTURER) REQUIRED IN COMPUTER STUDIES

Applications are invited for the above post from suitably qualified persons to teach Computing up to HND level and also to Professional Courses.

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Further particulars and application forms from the Institute Registrar, North E. Wales Institute of Higher Education, Kelsterton College, Connah's Quay, Deeside, Clwyd CH5 4BR. Tel. Deeside 817531.

Closing date — 1st December, 1978.

HAMPSHIRE

Lansing Bagnall Limited are a major manufacturing group committed to the design and construction of industrial vehicles. The Data Processing department, which forms an integral part of the Management Services Division, are currently embarking on an extensive development programme, which includes the acquisition in mid-1979, of dual 2600s utilising IDMS Database and extensive on-line facilities.

They currently wish to recruit a number of staff at senior and junior levels, in both the Systems and Programming departments, to assist in the revision of systems involved in the transition from their existing Hardware configuration, and the development of a major on-line Production Control System.

SENIOR SYSTEMS ANALYSTS

Salary Circa £6,000

Reporting to a Systems Project Leader, suitable applicants will be able to show three to four years involvement in the design and successful implementation of major systems. As the most important systems development project currently being considered is a Production Control System, applicants with a background of manufacturing or engineering systems will be of particular interest, although a background of Financial systems would also be considered. Essential qualities in candidates will be the potential to control given project teams, the ability to communicate in depth with User groups and all levels of management, and the ability to supervise and co-ordinate junior members of the team.

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SEE PAGES 47, 50, 51

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Computing Services Association

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TSB

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Reference PG47/1

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Reference PG47/2

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Reference HK47/4

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REF. 1956

IBM — HOLLAND

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REF 1881

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REF. 1834

IBM — CITY

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REF. 1938

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HONEYWELL 6600 TDS PREF	IMMEDIATE	MIDDX	£200 + p.w.

BENELUX

Mini Fortran scientific:	Holland	Jan start	£370 p.w.
PDP Macro II RSXIIM	Holland	Imm start	£370 p.w.
IBM OS COBOL + Assembler	Holland	Imm start	£350 p.w.
PDP Fortran kn of French	Brussels	Long term	£375 p.w.

SYSTEMS ANALYST
£475 p.w.
HOLLAND

Large IBM user needs analyst with financial modelling experience in banking environment.

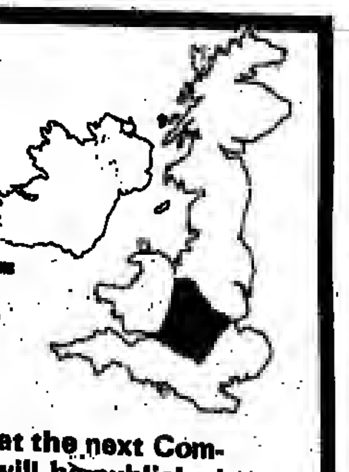
FRANCE

SEN ANALYSTS kn of either Fr/Ger/Dutch	France	£ Exc rate
ANALYSTS kn of either Fr/Ger/Dutch	France	£ Exc rate
IBM AN/PROG COBOL/PL/I or ASS kn of Fr/Ger/or Dutch	France	£ Exc rate
IBM PROGRAMMER ASSEMBLER COBOL or PL/I kn of French German or Dutch	France	£ Exc rate
IBM JUNIOR PROGRAMMER ASSEMBLER COBOL or PL/I kn of French, German or Dutch		£ Exc rate

Computing Services Association

Ring Christine Kay/Dave Hayton 734 0152/6 (24 hours)
27 NOEL STREET, W.1
Offices: Amsterdam, Paris, Manchester, Birmingham

MIDLAND RECRUITMENT FEATURE



Advertisers are reminded that the next Computer Weekly area feature will be published on December 7 and will highlight career opportunities in the Midlands.

Space reservations should be made as soon as possible to:

Basil McGowan — Birmingham — 021-356 4838
Eddie Farrell — London — 01-261 8097

Copy Deadline: PM Friday before

COMPUTER WEEKLY
THE INDUSTRY'S WIDEST READ AND MOST REQUESTED NEWSPAPER

UNIVERSITY OF NOTTINGHAM CRIPPS COMPUTING CENTRE

Applications are invited for the post of

SYSTEMS PROGRAMMER

The Centre operates a linked ICL 1906A/1904S configuration under the George 3 operating system, together with two DEC PDP11/40's providing data preparation and screen editing facilities, and a CTL MOD 1 providing BASIC. The Centre is also actively participating in the development of a new regional network which will fully interconnect the main computing services of the six Midland Universities.

The successful candidate will be required to work in a group providing user and operations support (planning and advisory services, production of utilities and applications packages, validation and support systems software) and to contribute to the Centre's development projects (including operating systems, accounting and budgeting, workflow scheduling and online networks).

Experience of scientific programming language is essential (preferably FORTRAN, ALGOL 60 or ALGOL 68)

Initial salary will be in a range of £5,604 (under review) with USS according to age and experience.

Further particulars and forms of application, returnable not later than 27th November, 1978, from the Staff Appointments Officer, University of Nottingham, University Park, Nottingham NG7 2RD. Ref. No. [illegible]

INTERNATIONAL BANKING —EDP

We are a major American Bank, long-established in London. Presently we are expanding our activities considerably worldwide and particularly in Europe. Major data processing projects are currently being developed and more are planned in London, Europe and the Far East. The equipment is mainly IBM 370 and system 3.

As a result of this expansion we wish to recruit a capable young man or woman to join our EDP Audit team. Excellent training and experience will be given and an attractive career development is offered.

The successful candidate will have at least three years' Data Processing experience, including Programming and Systems Analysis, preferably in a banking environment. Knowledge of a foreign language will be useful but is not essential.

An excellent salary will be offered for this position with attractive and generous fringe benefits usually associated with a first class bank.

Applications, which will be treated in complete confidence should be addressed to Box No. RD.5000, c/o Extel Recruitment, 4 Bouverie Street, London, E.C.4. Any banks to whom applications should not be forwarded should be clearly marked on the back of the envelope.

CUSTOMER SERVICE ENGINEERS

To support a fast expanding customer base the following experienced personnel are required:

1. **R.B.T. ENGINEERS** — required to support a variety of configurations. A knowledge of line printers, card readers, VDUs, disc drives and communications protocol (Univac 1004) preferred.
   Locations — Manchester/Cheshire and London
2. **WORD PROCESSOR/INTELLIGENT TERMINAL ENGINEERS** — We have over 400 installations of micro processor based systems on contract and require engineers with VDU, FLOPPY DISC and MICRO PROCESSOR experience to continue our high level of support.
   Locations — West Midlands and London.
3. **MINI COMPUTER ENGINEER** — To service our manufactured System 90 computer and American manufactured systems interfaced to a wide variety of peripherals. Some knowledge of high speed data acquisition and real-time operating systems desirable but not essential.
   Locations—Stevenage/East Midlands.
4. **SOFTWARE INSTALLATIONS ENGINEER** — To carry out installation of our graphics systems software. Our new range of MICRO-PROCESSOR based graphic systems are being supplied to a wider market and we therefore need a software engineer with knowledge of a variety of mainframe operating systems. Experience of Fortran, assembler and Coral desired.
   Location — Chandler's Ford, Hants.

All the above posts offer above average salaries, Company Car and generous allowances.

Contact:
Customer Service Department
Computer Instrumentation Limited
School Lane, Chandler's Ford
Eastleigh, Hampshire
Telephone: Chandler's Ford 66321

MESSAGE SWITCHING

LONDON—HOME COUNTIES & EEC
£8-£9K (U.K.) £10-15L (ECC)

If message switching is your forte and you value working at the cutting-edge of developments in the switching field such as System-X then we have our clients' authority to initiate serious negotiations with a view to offering you what can only be described as a superlative career opportunity involving advanced applications in an environment fostering creativity, innovation and design freedom coupled with significant autonomy. These opportunities will ideally suit experienced message switching applicants (2-5 years). Our client specifically requires Senior Analysts, Analyst Programmers, System Designers and Programmers at various levels of seniority. The principal programming languages are Assembler, Coral 66, Pascal, etc. If your hardware background includes PDP, NOVA, Philips, Intel, Prime, etc., you will be at the top of the short-list straight off. For an early interview telephone Matrix as soon as possible.

MATRIX

Telephone 01-491 4436 (10 Lines)
360 Oxford St, London W1N 9HA.

SENIOR PROGRAMMER — ACTON

Salary range £5,800-£8,000

For on-line train control.

- **— Twin GEC 4080.**
- **— Using CORAL 66 + BABBAGE**
- **— Also linked to an IBM 370/148.**

Interested in joining one of London's fastest growing computer departments, working on a centralised signalling control system to the Tube Lines?

Career prospects are excellent, and we offer:

FREE TRAVEL ON LONDON TRANSPORT SERVICES AND OTHER VALUABLE TRAVEL CONCESSIONS.

Write for an application form, quoting ref. 345/C to Staff Appointments and Development Officer, London Transport, 55 Broadway, London, SW1H 0BD, or phone 01-222 5600 ext. 833.

LONDON TRANSPORT

MIDDLE EAST £10,000-£15,000 TAX FREE

LOOKING FOR AN OPPORTUNITY TO ACCUMULATE CAPITAL?

We are recruiting for an American Oil Company, who seek experienced Programmers and Analyst/Programmers for one-year contracts (renewable).

You should have had three to five years' applications programming experience, including 370 (ideally OS/MVS), and be familiar with either PL/1, COBOL, FORTRAN or Mark IV. There are also openings in Systems Design and Database Design/Management.

Please ring us for a preliminary talk, quoting ref. 956. Messages will be recorded after hours.

EDP SYSTEMS 01-637 5796
52-53 Margaret St. London WIN 7FF

COMPUTER RECRUITMENT DIVISION

SYSTEMS & PROGRAMMING

ICL COBOL — TO £5,000 + Mortgage
A leading Merchant Bank offers outstanding opportunities for bright young programmers with one year a good Cobol experience. Excellent prospects for the right candidate.

COBOL — £6,000
A West London based multi-national is currently seeking programmers with eighteen months' experience. Mainframe is immaterial as full re-training given.

IBM DOS COBOL — £5,500
Excellent prospects for a go-ahead programmer with eighteen months' experience on 370 hardware, excellent perks.

SYS. MANAGER — TO £7,800
An experienced Ops Manager with the ability to diagnose faults and motivate staff will find a new challenge in this installation. Phone for details.

ANALYST/PROGRAMMER — TO £7,500
One of the City's foremost Insurance companies requires a programmer/analyst, three years' experience on IBM System 3. A knowledge of the Insurance business would be an advantage. Top prospects.

MINI SPECIALIST BASIC PROG — TO £8,000
Work out of London and capitalise on your experience with this Surrey-based company who are looking for people with a minimum of one year's DEC/PDP experience.

OPERATORS

OPERATOR, £4,500 — NCR CENTURY
A progressive London company [illegible] are looking for a Century or Criterion Operator with 18 months' experience. Good prospects and excellent perks. Ref. 506

SNR. OPERATOR, £4,620 — IBM 370
An Operator with DOS [illegible] Power experience is required by a West London company in the [illegible] industry. They operate on a [illegible] staff system and offer excellent prospects. Ref. 505

SHIFT SUPERVISOR, £5,432 — IBM 370
A world-wide organisation based near Croydon are offering excellent rewards for people with two years' DOS/VS Power/VS experience. Ref. 504

OPERATORS ICL 1903T — £4,750
Get a bird this Christmas, that's just one of the perks offered by this West London Company — a free turkey, plus free lunches and four weeks' hols. All they ask is that you should have sound ICL 1900 experience under GEORGE. Ref. 132

TWO SHIFT LEADERS, ICL 1902T — £5,000
Operating under GEORGE, this North London Co. offer good flexi hours, free meals, 4 weeks' hols and a cheap mortgage. Ref. 208

ICL OPERATORS 2904, 2903, 1903 — UP TO £4,700
With GEORGE and GEORGE experience in Central London and the City. Excellent benefits for junior and senior ops.

STAFFSCENE
9 ST. BRIDE STREET, LUDGATE CIRCUS, LONDON EC4
24 hrs. answering service **01-353 6931**

Systems Analysts
£5,500-£8,500 — West London

WHY CHANGE COMPANY?

Similar to many companies, we are looking for systems analysts. The difference is that we require people capable of developing major sophisticated systems, implementing them throughout Western Europe, using the latest mainframe and terminal equipment.

Our Client, a major multi-national Group, requires ambitious young people capable of responding to a demanding environment, communicating effectively and yet retaining a mind for detail.

If you are looking for:
- broader experience of sophisticated systems
- opportunities of travel to Europe
- greater responsibility and contact with line management
- the backing of a multinational group offering both formal and on-the-job training leading to early promotional prospects

We require:
- one to eight years' experience of system analysis, ideally with a knowledge of on-line systems, minicomputer application or I.B.M. mainframe
- a sound track record and knowledge of programming
- an agile mind capable of assuming early budgetary responsibility and project management

Ring today and arrange a fully confidential meeting at one of our regional career guidance evenings, or before if necessary.

LONDON · BIRMINGHAM · GLASGOW
MANCHESTER · BRISTOL · BOURNEMOUTH

Mel Cayzer, B.Sc.(Econ.), C.Eng., M.I.Mech.E., M.I.Prod.E., Ref: 873, Barnett Keel Ltd., Providence House, River Street, Windsor, Berks. SL4 1QT. Tel: Windsor 57011. Telex: 849323.

Barnett Keel MANAGEMENT SEARCH

BRUSSELS

SR SYSTEMS ENGINEERS IBM OS
SALARY RANGE £14-£17,000 p.a.

Would you like to join a high powered team of software professionals in the Belgian office of our U.S. client? If you have sound IBM O.S. systems experience relating to either Production Control, Industrial applications, Banking or Major Financial systems we would like to hear from you. An Assembler background is essential and additionally PL/1 could be an advantage but is not essential. These positions are permanent, however the opportunity to transfer back to the U.K. headquarters is a possibility after an 18 month to 2 years tour in Brussels. Naturally all relocation expenses for yourself and family will be borne by the client. The ideal candidates will be self starters with prior experience at working in a team environment. Salaries will be exceptionally high to reflect the prominence which our clients' place on the acquisition of these key personnel. Interviews will be held in London as soon as applications are received.

MATRIX
Telephone: 01-491 4636 (10 Lines)
360 Oxford St. London W1N 9HA.

WEST CUMBRIA — UP TO £6500

SYSTEMS MANAGER

West Cumberland Farmers is Britain's largest agricultural co-operative with a group turnover of £122 million in 1977. Our central administration offices, including all computer staff, are based at Whitehaven, which is situated on the Cumbrian coast within easy reach of the Lake District.

The present mainframe, an ICL 1901T with 64K and EDS 60s, supports a wide variety of general accounting and management information reporting systems. In addition there are 7502 terminals in both Whitehaven and Carlisle and a 7181 video in Hexham all using an on-line invoicing system.

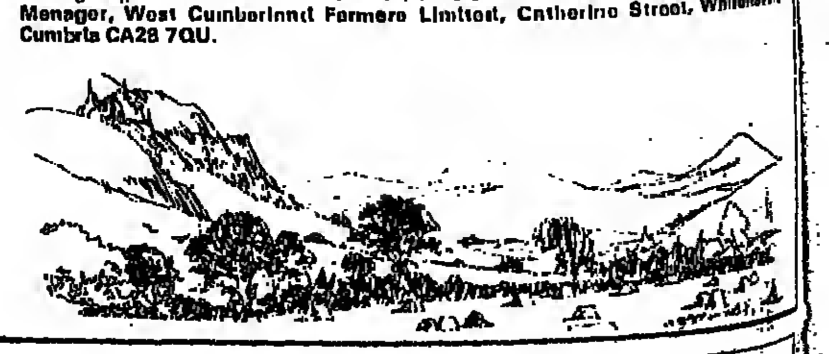
The company is now developing a computer strategy for the next 5 years. The resultant strategy will involve the replacement of the existing hardware and the implementation of new systems and procedures.

To assist in this development we wish to recruit a Systems Manager who will head up an expanding systems department which provides a service to the major functions within the organisation. He/she will also be capable of deputising for the Management Services Manager for the supervision of the Computing Services department.

Applications are invited from candidates with a minimum of 5 years' systems analysis experience during which time they must have successfully controlled, developed and implemented at least two major projects. Candidates should also have had experience of developing accountancy related systems. Some experience in developing on-line systems and/or a programming background, preferably on ICL equipment, would be desirable.

Benefits include a starting salary of up to £6,500, pension and life assurance schemes, flexible working hours and assistance with relocation expenses where applicable.

Write giving full details of career to date, to: **Derek Robinson, Divisional Personnel Manager, West Cumberland Farmers Limited, Catherine Street, Whitehaven, Cumbria CA28 7QU.**



Analyst/Programmer
South Wales

The Company, part of a world wide group, operates a modern Nickel Refinery and associated Chemical Products Plant at Clydach, near Swansea, South Wales.

The data processing function has developed over the past 10 years and we are now upgrading our installation to facilitate the implementation of a number of new projects which will involve teleprocessing and RJE support to other Company locations in the U.K.

We are seeking an experienced Analyst/Programmer with at least 3 years commercial background, preferably using IBM equipment.

The successful applicant will possess a sound knowledge of DOS/VS with COBOL RPG II and ideally, CICS.

Salary and other terms of employment are fully competitive and include a non contributory Pension and Life Cover Plan. Reasonable relocation expenses will be paid where necessary.

Please write for an application form to the:
Senior Personnel Officer,
INCO EUROPE LIMITED,
Clydach Refinery, Clydach, Swansea SA6 5QR.

inco INCO EUROPE LIMITED

The Polytechnic of North London
Holloway, London N7 8DB
01-607 2789

LONDON POLYTECHNICS COMPUTER UNIT

USER SUPPORT PROGRAMMERS

Two new vacancies exist for experienced programmers to strengthen and enlarge the advisory role of the computer unit. They will join a team giving advice and support to students, staff and research workers and will also undertake applications work, software evaluation and implementation. A wide range of applications and disciplines is involved by specialization would be encouraged. A degree or equivalent professional qualification is required and experience in the use of time-sharing systems and in both high- and low-language is desirable. Experience or interest in computer-aided design, architecture, electronics, business systems or social science would be an advantage.

The hardware:
Dec-10 KL processor (512k) with 600 megabytes of disc storage and a full range of peripherals and interactive terminals.

The salary:
On scale from £5058 to £6841 (including London allowance).

Further information and application forms from Head of LPCU, Polytechnic of London, Holloway, N7 8DB.

It's a small world
with big opportunities for a Programmer and Operator

It's a world in which our PDP11/34-RSX11M mini-computer installation is playing an important role at our pleasantly situated headquarters in Ewell, an attractive village just north of Epsom in Surrey.

We're the Taylor Nelson Group, a leading independent market research company. We provide ad hoc and continuous studies covering a diverse range of markets such as food, pharmaceuticals and agricultural supplies as well as data covering financial and social trends.

Expansion of our activities in all market areas means that we now require additional men and women to fill the following appointments within our growing DP Division.

Systems Support Programmer

To develop and maintain batch and interactive software for both new and existing applications. At least two years' practical programming experience is required with a good knowledge of FORTRAN and some Assembler, preferably on a mini-computer. An interest in data capture techniques would also be desirable.

Computer Operator/Data Librarian

To be responsible for computer operating, data administration, documentation control, and the implementation of installation standards. An overlapping two shift system is in operation — 0800 to 1600 and 1200 to 2000. At least one year's operating experience is required, preferably on mini-computer systems. An ability to construct and operate data administration procedures is also desirable.

Both appointments carry good salaries and company benefits and there are first-class career prospects.

Write with details of your experience to Roger G. Shallcross, Systems Support Manager, Taylor Nelson Group Limited, 457 Kingston Road, Ewell, Epsom, Surrey.

THORBAR
RECRUITMENT AND CONSULTANCY SERVICES LIMITED
Greenock House 19 Cuckfield Road Hurstpierpoint Sussex
Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

Ref. CW/1/78

SENIOR COMPUTER PROFESSIONALS
UP TO £8,500 PLUS BONUS
LONDON WEST END

Our client is a fast growing and very dynamic organisation who are relatively small in terms of numbers of staff employed, but are extremely efficient. This efficiency is due in no small measure to their commitment to D.P. Techniques employed include Database and On-line working. To keep abreast of planned development, the present hardware is due to be upgraded to a more powerful processor early next year with minis in remote locations to form the basis of a network system. In preparation for this event, experienced professionals are now required to fill vacancies as PROJECT MANAGERS AND SYSTEMS ANALYSTS.

PROJECT MANAGERS — £7-£8.5k

Must show evidence of:
- Substantial involvement in D.P. over a period of between 4-7 years.
- Genuine management ability leading mixed project teams comprising Analysts and Programmers.
- Successful implementation of at least one major system.
- Mature and pragmatic thinking ability coupled with a positive empathy towards identifying and resolving user requirements.
- High technical awareness ideally backed up by a programming and systems background.
- Being competent at assessing accurately budget and time constraints and working successfully within these parameters.

SYSTEMS ANALYSTS — £5.5-£7k

Should have:
- At least 12 months' experience as an Analyst.
- Successfully seen one system from design stage through to actual implementation.
- A Programming background, although this is not absolutely essential.
- An interest in working on large projects involving the use of DB, Communications and Distributed Processing.
- The ability to work effectively in a young, expanding and very dedicated environment.
- An earnest wish to be judged on performance and a chance to accelerate their promotion prospects.

ASSISTANCE WITH RELOCATION WILL BE CONSIDERED WHERE APPROPRIATE

PLEASE WRITE OR TELEPHONE US NOW IN ORDER TO MAKE ARRANGEMENTS FOR IMMEDIATE INTERVIEWS TO TAKE PLACE EITHER IN LONDON OR THE SOUTH — OR IF MORE CONVENIENT, TELEPHONE JACK COLLINGS, OUR MANAGING CONSULTANT, BETWEEN 7.00 AND 9.00 P.M. ON (0273) 833120.

A Computer Peripheral Company, a world leader in the field of Document Reading Systems is seeking a

TECHNICAL DIRECTOR
c. £12,000

Applicants must have a good engineering degree and have relevant creative experience in digital electronics preferably in the computer industry. Practical experience of micro-processors, electromechanisms and optics would be highly desirable.

The Technical Director will have total control of the development function in the Company and proven experience of managing major projects is essential.

Location — Thames Valley.

Please send full details, mentioning reference UR, to:

Christopher Gold
Executive Dynamics
Management Search & Selection Consultants
23a High Street, Hemel Hempstead, Herts.

This vacancy is open to male and female applicants. No details will be passed to our client without prior permission.

UNIVERSITY OF ASTON IN BIRMINGHAM
Department of Electrical and Electronic Engineering

RESEARCH FELLOW
Microprocessors

Applications are invited for the above post. The person appointed will be responsible to Professor H. A. Barker for hardware and software developments in microprocessor systems within the Department and the work will involve the design and development of industrial and teaching systems, based principally on the TMS 9900 microprocessor, using the full range of facilities available in the Department.

The Research Fellow will also be required to assist in the organisation of, and participate in the teaching in, the short courses in microprocessors which are a regular feature of the Department's programme.

Commencing salary will be within the range £3883 to £4882 p.a. on a scale rising by annual increments to £5888 p.a.

Application forms and further particulars may be obtained from the Staff Officer (Ref. 318/102) University of Aston in Birmingham, Gosta Green, Birmingham B4 7ET (Tel: 021-359 3611 ext 201) and applications should be returned by 15th December 1978.

Thames Polytechnic

Computer Centre

Programmers

[illegible]

Systems Analyst

Our Client, a progressive company servicing the automotive industry and situated in South Birmingham, has a career opportunity for a suitably experienced person (male or female) to join them as a Systems Analyst.

Applicants should have a university degree in Mathematics and at least five years commercial experience, preferably in production control. A knowledge of computer systems is essential.

The rewards offered include a good salary, 5 weeks holiday, pension scheme and other benefits and excellent prospects for promotion.

Please write enclosing brief details of career to date quoting ref. no. BP/35486 on both envelope and letter and stating any companies you do not wish your application forwarded to:

Riley Advertising Limited,
Riley House,
Castle Bromwich Hall,
Birmingham B36 9DX.

A member of the Rex Stewart Group.
LONDON BIRMINGHAM BRISTOL EDINBURGH
GLASGOW LIVERPOOL MANCHESTER
NEWCASTLE NOTTINGHAM PERTH

Confidential Reply Service — **Riley**

Systems Analysts

Computer Services Division of the Bank providing On-Line and Batch Services to 400 branches as well as to Head Office Departments and Subsidiaries

We are
—The Computer Services Division of the Bank providing On-Line and Batch Services to 400 branches as well as to Head Office Departments and Subsidiaries
—Currently processing on 2 X IBM 158's, 1 X IBM 155
—On the threshold of extensive new developments
—Due to occupy a new purpose built computer centre in Mid '79

We offer
—The opportunity to work hard in one of Europe's most beautiful cities in congenial surroundings with professional colleagues
—Starting salary not less than £4,953 and (where appropriate) attractive House Purchase Facilities
—Non contributory pension scheme
—22 days holiday
—Continuing training
—Flexible working hours

We require
—A Degree or equivalent Professional Qualification
—A minimum of 2 years experience in the investigation, design and implementation of commercial D.P. systems

If you are interested, write for an application form to:

Mrs. M.C. Pinkerton,
Assistant Staff Controller,
Bank of Scotland,
2 Robertson Avenue,
EDINBURGH EH11 1PZ.
Telephone: 031-337 2488 (extension 186)

BANK OF SCOTLAND COMPUTER SERVICES DIVISION

Programmers Systems Analysts

The Warton Division of British Aerospace has vacancies in the Divisional Spares Department, based at Samlesbury, for Programmers and Systems Analysts.

Senior Programmer

with 4 to 5 years' programming experience is required to head a small team engaged on the development of commercial systems concerned with the procurement and delivery of spares. COBOL experience is essential and a knowledge of I.B.M. O.S. operating systems is preferable, but training will be given to successful applicants.

Systems Analysts

with 2 to 4 years in Data Processing are required to join a Department responsible for commercial systems development for all aspects of spares supply. The job will involve user and customer liaison, design and specification of systems, their implementation and on-going support.

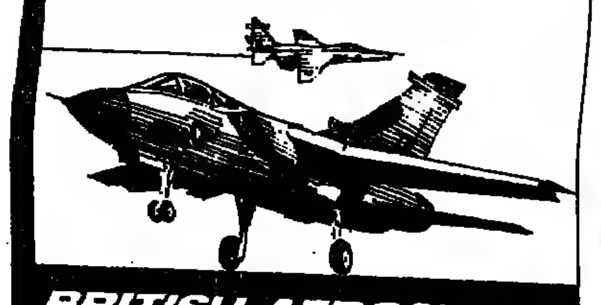
Senior Systems Analysts

are required to lead teams of analysts and programmers on major projects from conception to implementation. They will be responsible for all aspects of project management, including a high degree of customer liaison.

There is a choice of housing for rent or purchase in pleasant residential areas nearby and, where appropriate, generous relocation expenses will be paid.

Suitably qualified men and women are invited to write for an Application Form, quoting Reference No. CW/6/78 to:—

Mr. T. I. Salt,
Personnel Officer,
British Aerospace Aircraft Group,
Warton Division,
Warton Aerodrome,
Preston, Lancs. PR4 1AX.



BRITISH AEROSPACE
AIRCRAFT GROUP
Warton Division

Systems Manager

c.£8,000+car West Country

Our Computer and Administration Centre, based at Taunton, Somerset, provides the Debenham Group with a comprehensive range of management and financial services.

We are looking for a highly competent Systems Manager to be responsible to the Systems Development Manager for the provision and development of Computer Systems in a major business area of the Group's activities. Applicants, male or female, should have experience of planning and controlling large scale systems projects.

Please write or telephone for an application form, together with a copy of the job description and details of the excellent company benefits, from:–

Mrs. Elizabeth Kennedy,
Personnel Executive,
Debenhams Limited,
1 Welbeck Street, London W1A 1DF.
Tel: 01-408 4444 Ext. 544/730.

Debenhams

Research Vessel Services

Scientific Officer/ Higher Scientific Officer Systems Analyst/Programmers and Computer Engineers

There are vacancies in the Shipborne Computer Group at the Research Vessel Services for Systems Analyst/Programmers and Computer Engineers to work on oceanographic data acquisition and processing systems. The Group is currently using PDP 11, IBM 1800 and IBM 1130 computers and the successful applicants will be expected to work at sea on research vessels for short periods each year.

QUALIFICATIONS/EXPERIENCE

Normally below age 27 with a degree, HND, HNC or an equivalent qualification in an appropriate subject. A pass in BCS Part II and relevant experience is acceptable. For the systems analyst/programmers experience in real time programming would be an advantage. For the computer engineers a good electronics background is essential. Candidates for HSO should have at least two years post graduate experience for those with an Honours degree or five years experience for those with HNC/HND.

SALARY AND CONDITIONS

The appointment will be to the Scientific Officer or Higher Scientific Officer grade. Starting salary will depend on age and experience but will be within the following scales:

Scientific Officer — £2839-£4415 pa
Higher Scientific Officer — £4101-£5448 pa

In addition under the present regulations a Scientific Officer, for example, could expect to increase his/her earnings by at least £1,000 pa with normal sea going duty. There is a non-contributory pension scheme.

Staff of the NERC are not Civil Servants but their pay and conditions of service are similar to those of the Civil Service.

Further details and application forms may be obtained from: **Jan Hill, Research Vessel Services, No. 1 Dock, Barry, South Glamorgan CF6 6UZ. Tel: Barry (0446) 737451.**

Quoting post reference: RVS/SC/78/1-S.

Closing date for receipt of applications: 13 December 1978.

Natural Environment Research Council

COMPUVAC

OPERATIONS

OPERATORS

IBM				
360/VS	SENIOR OP	3 YRS EXP	£5300+	N.LON.
OS	OPS SUPPORT	1½ YRS EXP.	£4800+	C.LON.
OS/VS	SENIOR OP	2 YRS EXP.	£4600	CITY
DATA 100	SUPERVISOR 2 YRS	2 YRS EXP.	£4500	ESSEX
SYST/3	OPS MANAGER	6 YRS EXP.	£6000	S.LON.
ICL				
GEORGE 2	SENIOR OP	2 YRS EXP.	£4500	SURREY
VME/B	SENIOR OP	2 YRS EXP.	£4800	W.LON.
GEORGE 3	OPERATOR	1½ YRS EXP.	£4000	W.LDX.
2904	OPERATOR	6 MONTHS EXP.	£3500	W.LDX.
HONEYWELL				
GCOS	1 OP/SUPERVISOR	4 YRS EXP.	£6000	W.LON.
UNIVAC				
EXEC8	SENIOR OP	18 MTHS EXP.	£4800	C.LON.
NCR				
88	SENIOR OP	2 YRS EXP.	£5000	C.LON.
ANY MAINFRAME				
OPERATORS	2 YRS EXP. ON LARGE M/Cs		£5000+	CROYDON
DATA CONTROL, ANY SYSTEM				
2 YRS EXP. DAYS ONLY				
1 YR EXP. SHIFT			to £4,000	SURREY
6 MTHS EXP. SHIFT			£4000	ESSEX
			to £3700	W.LON.

This is obviously just a cross-section of our current job file, call us now for your next move!

01-248 6367 24 hours

APPLICATION PROGRAMMERS

COBAL

U.S.A. c.£17,000

If you are a "cobal" application programmer with experience in one of the following:-

O.S.V.S.	A.S.P.
M.T.A.M.	370
DATA BASE	B.80
I.M.S.	1108
E.D.S.	SIMILAR

and would like to work in the United States of America on a renewable one year contract with relocation expenses paid, married or single status, ring me now.

APPLICATION SYSTEMS PROGRAMMERS

GERMANY £20,000-£24,000

If you have experience in P.L.1., M.V.S., or similar, can speak a little German and would like to work in Germany ring me now.

Peter O'Hara on 01-584 9285 or 01-584 8475 or write

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30 Thurloe Place, London SW7 2HO

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If you've had upwards of two years' solid analysis or programming experience — ANY LANGUAGE, ANY MACHINE — and want to widen your know-how, with appropriate training, this opportunity could well interest you.

We are recruiting for clients, a substantial software house with a human face. They have have a high reputation for good quality project work in the Greater London area.

To sustain their present growth they are seeking mature people with a professional outlook who:

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- *wish to broaden their applications and hardware experience, particularly real-time and minis*
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Please ring us in confidence (Ref. B4B) for a preliminary exchange of information, or leave a message on our answering machine after hours and we'll ring you at home.

EDP SYSTEMS 01.637 5796
52-53 Margaret St. London W1N 7FF

UNIVERSITY OF THE WEST INDIES — JAMAICA

Applications are invited for the post of

SENIOR PROGRAMMING CONSULTANT

in the DATA PROCESSING SECTION COMPUTING CENTRE. The duties of the post will include (a) giving advice to users and prospective users, (b) upgrading the systems and modifying statistical packages, and (c) responding to requests for consultation. Applicants should have at least five years experience in Data Processing, should be proficient in Fortran and either Cobol or RPG languages. Experience of Computing in a university environment would be an advantage. Salary according to qualifications and experience on the scales J$12,066-16,897 p.a. (or J$8,913-13,917 p.a.) (£ sterling = J$3.28) F.S.S.U. Study and Travel Grant. Unfurnished accommodation will be let by the University at a rental of 10% of salary, or a housing allowance of 20% of salary will be paid. Family passages. Detailed applications (2 copies) with curriculum vitae, naming 3 referees should be sent as soon as possible direct to the Registrar, University of the West Indies, Mona, Kingston 7, Jamaica. Applicants resident in the UK should also send one copy to Inter-University Council, 90/91 Tottenham Court Road, London W1P 0DT. Further details may be obtained from either address.

UNIVERSITY OF LONDON COMPUTER CENTRE

USER SUPPORT DEPARTMENT

WANTED, for the Compiler Section, a

PROGRAMMER

who is interested in. PASCAL, COBOL, SNOBOL, LISP, SIMULA, SIMSCRIPT, ALGOL 60, ALGOL 68, BCPL, BASIC and FORTRAN.

Applicants should have an interest in Compiler Maintenance, and have the capacity to perceive and include useful user facilities into existing Compilers, plus an interest in helping users with their programming problems.

Candidates should preferably be Computing Science graduates with an interest in a wide range of languages.

Salary will be in the range of £3,386-£6,655 plus £450 London Allowance (both under review).

Application forms are available from the Assistant Secretary, University of London Computer Centre, 20 Guilford Street, London, WC1. Telephone No. 01-405 8400, and should be completed and returned by 14th December. 1978.

A.T.E. PROGRAMMER

c. £6,500

Cambridge Scientific Instruments need programmers to join our A.T.E. team. We use [illegible] 1792A and D equipment and are committed to a very high level of product reliability and output. The team has total responsibility for programming and production test services. The duties will include analysing digital, analog and hybrid circuits and designing production orientated test software. Degree level qualifications are desirable and starting salary depends on experience. For further details and application form write or phone Colin Gupta at:

CAMBRIDGE INSTRUMENTS
Rustat Road, Cambridge
Tel. (0223) [illegible] Ext. 23

LANCHESTER POLYTECHNIC

at Coventry

Faculty of Applied Science

Department of Computer Science

SRC CASE STUDENTSHIP

Interactive systems for answering quantitative questions on a structured database. (In conjunction with the Ministry of Agriculture and Fisheries)

Graduates or those expecting to graduate, with First or Upper Second Class honours degrees in Computer Science or a Science course with a substantial element of computing, are required to undertake research relating to the above programme. A thorough knowledge of data structures and appropriate programming experience would be useful. The project will last for 3 years and the successful candidate will be expected to register for a higher degree. During the period of the studentship the appointee will spend a significant time in the collaborating establishment, and will be entitled to further remuneration.

Applicants are strongly advised to contact Dr. A.N. Godwin, Department of Computer Science, Lanchester Polytechnic, Eastland, Rugby (Telephone Rugby 74101) by Wednesday 29th November, 1978.

For application forms please apply in writing enclosing a foolscap stamped and addressed envelope to the Personnel Officer, Lanchester Polytechnic, Priory Street, Coventry CV1 5FB returnable by 4th December, 1978.

PROGRAMMER

Up to £4,146

We are looking for a man or woman with two years' wide programming experience in COBOL, preferably on HONEYWELL-200 equipment, to play an important part in a small team currently working on a variety of established financial and new corporate applications. A period of opportunity and challenge exists for a versatile programmer. The existing computer is due to be replaced in 1981 by more flexible and powerful equipment offering the opportunity for on-line applications. The opportunity will exist for training, including assistance with the British Computer Society qualifications.

As well as a salary in AP3, the Council offers relocation allowances (up to £500) and possible Council housing in appropriate cases.

For an informal discussion telephone Mr. Richard Freeman on Rugby 71177, Ext. 309.

Application forms and further details from the Chief Personnel Officer, 3 Newbold Road, Rugby. Tel. 71177, Ext. 203.

CLOSING DATE: 8th December, 1978.

RUGBY BOROUGH COUNCIL

THORBAR

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SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

Ref. CW/2/78

RPG2 IBM SYSTEM 34
£3.7k-£6k WITH EARLY REVIEW
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Our client is an affiliate of a leading American organisation operating in the leisure sector, who over the past 5 years has been the fastest growing company in each of its industries. Its product is the largest selling brand in the world and is synonymous with quality and success. The company's strong earnings position reflects its commitment to production efficiency and investment in high technology. World-wide it operates IBM main frames and D.P. figures prominently with development work schedules well into 1980 and beyond on a range of exacting and challenging applications. IBM System 32's are presently used with a System 34 about to be installed when on-line working will assume a priority.

They have an immediate need for PROGRAMMERS with:

- RPG 2 expertise on ANY HARDWARE
- Around 6-18 months' programming experience
- Cobol useful as a subsidiary language, although this is not essential.
- Either commercial applications experience or knowledge.
- The ability to develop their analytical skills and business understanding to assume greater responsibility.
- Well-directed enthusiasm, self-reliance and ambition.

GRADUATES IN COMPUTER SCIENCE or CDI trained persons with some RPG will be considered.

PLEASE WRITE OR TELEPHONE US NOW IN ORDER TO MAKE IMMEDIATE ARRANGEMENTS FOR INTERVIEWS TO TAKE PLACE IN LONDON OR THE SOUTH — OR IF MORE CONVENIENT, TELEPHONE JACK COLLINGS, OUR MANAGING CONSULTANT BETWEEN 7 P.M. AND 9 P.M. ON (0273) 833120.

How Computerised are you?

We are looking for two experienced ICI SENIOR OPERATORS to operate a 2-shift system in the busy Computer Terminal Section of Head Office at Millbank.

The successful applicants will soon be responsible for the total operation on a shift basis of a large new CMC Sovereign System shortly to be installed, and will be deeply involved with its implementation.

The Computer Terminal will be capable of communicating with a number of large IBM mainframe computers and it is essential that applicants should have relevant experience of operations, transmission circuits and modems, and ancillary equipment.

In addition to a starting salary in excess of £4300 pa (plus a shift disturbance allowance), ICI offers a profit sharing scheme, pension fund, recreation club facilities and a subsidised canteen.

If you are experienced, mature and interested please apply to: Miss June Nichols, Head Office Staff Section, IC House, Millbank, London SW1.

ICI

Computer Operator

Salary up to £4500 (including shift allowance)

As a major motor importer, Toyota has a large and expanding computer control function at its Crawley location. The department will soon be introducing a 'Wavotek' audio response system which will eventually be used by all 250 dealers in the Toyota network, therefore offering the successful applicant a good opportunity for development. Working on a 2 shift system and operating an ICL 1902T 80K machine, applicants should have a minimum of 18 months 1900 operating experience and a sound knowledge of George II. Salary will be according to experience and other benefits include car purchase scheme and 4 weeks holiday.

Please apply — Maureen Cross, Toyota (GB) Limited, 320 Purley Way, Croydon, Surrey. Tel: 01-681 1921. Interviews will be held at Crawley.

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Everything keeps going right

IMS

APPLICATIONS & SYSTEMS PROGRAMMERS
LONDON, SOUTH EAST, KUWAIT

An international client with an serious reputation in the application of IMS (DB/DC) to advanced commercial and technical areas has openings in London, Kuwait, Hampshire & Surrey. Applications programmers should have extensive COBOL or PL/1 experience and have worked under IMS for a minimum of 2 years. You will be given every opportunity to develop your skills within an environment which will encourage you to contribute ideas and expertise and where personal recognition is expressed in tangible terms. You will be expected to [illegible] responsibility and motivate team members working under your supervision. Salaries will be scaled to reflect not only your achievements to date but also your potential.

OVERSEAS SALARIES: £12-16K p.a.
U.K. Salaries: £7-£9,000 p.a.

Overseas based positions will ideally suit single-status personnel, however, there is a limited amount of married accommodation available. Serious consideration will be given to applicants who have previous experience of large financial systems under IMS. Interviews will be held in London as soon as applications are received.

MATRIX
Telephone: 01-491 4636 (10 Lines)
360 Oxford St, London W1N 9HA.

SHIFT LEADER

Up to £6,030 p.a.

A Shift Leader is required to lead a team of operator/control clerks who will run the ICL 2960 soon to be installed in Woolwich in December. A good practical knowledge of either VME/B or System 4J level is required as well as at least three years in senior operating posts. A two-shift system will be worked and the salary quoted includes the appropriate allowance.

Application forms from: Personnel and Management Services Office, London Borough of Greenwich: Peggy Middleton House, 50 Woolwich New Road London SE18 6HP (Tel. 01-854 8888 Ext. 2119)

Closing date 8th December, 1978.

The Council is an equal opportunities employer. All applicants will be considered, irrespective of sex or country of origin.

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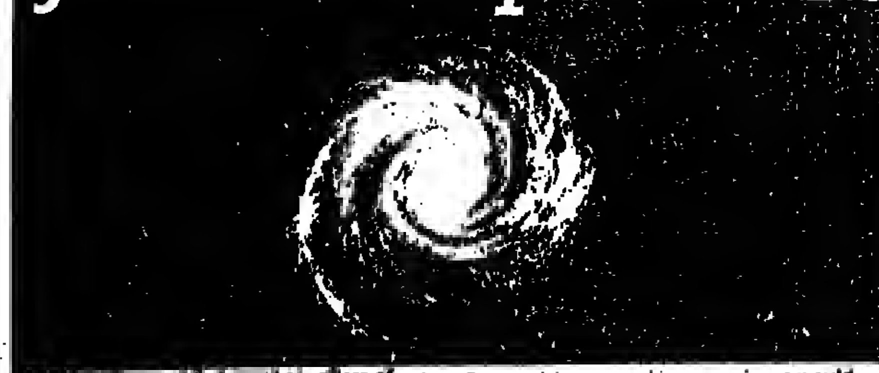

Wang, the world's largest suppliers of screen based word processing systems, are entering the second phase of their planned expansion in the UK. They have already doubled the turnover of their office systems division in the last six months and have just announced major enhancements at the top and bottom of their product line, giving them a span from a single screen stand-alone word processing system for £6,300 to a complete office information processing system with up to 32 devices and strong communications capabilities at up to £160,000. To cope with these developments Wang urgently needs more people.

Word Processing Analysts

Requirements are a good general computing background, especially with small to medium sized processors and the ability to specify systems for text processing applications. A minimum of 5 years' experience and a knowledge of telecommunications protocols and operating systems are essential together with proven experience of the sales support function. The post is based in London but will involve some travel including overseas. Minimum salary will be £7,500 p.a. plus bonuses, car and the normal benefits expected from a large international company.

Customer Support Representatives

The requirements are a strong administrative or secretarial background, the ability to work under pressure and a good personality. Some training or teaching experience would be useful together with a knowledge of the computer environment allied to screen-based word processing systems. The posts are based in London or Birmingham but will involve some UK travel and flexibility of working hours. Minimum salary will be £4,500 p.a. plus bonuses, car and the normal benefits expected from a large international company.

Field Service Engineers

Requirements are a good knowledge of screen, disk and diskette based systems with at least City and Guilds/ONC/HNC or equivalent field experience. A minimum of three years in data processing or word processing is essential. There are vacancies in the London and Birmingham areas. Some overtime will be required. Minimum salary is £4,500 p.a. plus bonuses, car, expenses and the normal benefits expected from a large international company.

WANG
COMPUTERS AND OFFICE SYSTEMS

Phone Mrs. P. Steer on (01) 242 6654 for further information, but please send a full c.v. to her at Wang (U.K.) Limited, Office Systems Division, Chichester House, 278 High Holborn, London WC1V 7ZE.

UNIVERSITY OF SURREY
COMPUTING UNIT

ADVISORY PROGRAMMERS

Salary scale to £6555 per annum

Applications are invited for TWO Advisory Programmers. One of the posts will be concerned with the production, implementation and support of applications software, and some interest in either statistical or graphical techniques would be highly desirable.

The second post will be concerned with the development of micro-processor applications within the computing service and the successful candidate will be expected to organise seminars, courses and workshops, both for members of the University and external organisations.

One of the posts will be for a limited two-year period and both will be on the same salary scale with generous annual leave.

Applications, in the form of a curriculum vitae, and the names and addresses of two referees should be sent to the **Staff Officer, University of Surrey, Guildford, Surrey GU2 5XH, or telephone Guildford 71281, extension 470 for further information.**

DEPARTMENT OF ENGINEERING

Engineering Analyst/ Programmer

Post Ref. E2115

Grade AP4/5

Salary £3933-£4761

plus £312 per annum supplement

A vacancy exists in the Computer Section of the Department of Engineering, based at County Hall, Barnsley, working in a small team covering many aspects of civil and traffic engineering. Known future projects include Urban Traffic Control, Highways Information Systems, Highway Designs and Graphics. The Department uses the County's ICL 1904S, a PDP based graphic workstation and WANG, mini-computer and also accesses bureau using an intelligent terminal.

Applicants should possess a degree level qualification in a technical subject. Relevant experience would include FORTRAN and the use of technical packages and knowledge of a non-technical language is desirable.

Closing date for applications will be 8th December, 1978. Please write or telephone for an application form, quoting the above post reference, to the Chief Executive (Personnel), South Yorkshire County Council, County Hall, Barnsley S70 2TN. Telephone Barnsley (0226) 86141 extension 269.

South Yorkshire County Council

ENERGY IN ACTION

ANALYST-PROGRAMMER

PLI on IBM 370 under OS

Esso Standard Libya Inc. invite applications from suitably qualified and experienced Analyst Programmers, to fill this [illegible] well paid vacancy at their Tripoli offices in Libya.

The applicant will participate in the development and maintenance of Commercial Application systems, but should also be able to assist local systems support staff where necessary and should be prepared to advise and train local Analysts.

Candidates, aged 27-40, should have at least [illegible] years relevant systems experience. A thorough knowledge of PLI is essential coupled with knowledge of OS VSI and IBM utilities. A qualification to degree standard in Science, Accounting, Business Studies, Computer Science, Mathematics or equivalent would be [illegible].

Excellent terms and conditions of employment are offered, on either Married or Batchelor status, with generous salaries and allowances. Accommodation is provided. Leisure facilities are [illegible] with 4 weeks fully paid home leave (door to door) per year.

Please write initially with brief personal career details, quoting reference OR/451 to:-

Mr. W. J. Solley, Esso Libya, Employee Relations Department (Overseas), Esso House, Victoria Street, London SW1E 5JW.

Esso

Libya

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Analyst/Programmer £5,100-£5,900
Cobol Programmer £4,500-£5,100

Our UK Computer Dept. is widening its programme of cost-effective development with IBM 370 hardware and during the next two years this will include new systems and terminal facilities at several manufacturing locations. If you'd like to join a team that is well motivated, successful and is working closely with its users we'd like to hear from you.

We need two people, preferably with

- formal qualifications in Computer Science
- a background of financial and commercial systems with a manufacturing company
- DOS/VS, CICS and DL1 experience

If you would like to find out more, including details of staff bonus scheme, relocation expenses and mortgage assistance, call Brian Bickmo0 on Byfleet 41161, or write to him at Van Leer House, West Byfleet, Surrey.

Senior Computer Operators (3031/158)

£4,500 plus

We are seeking Senior Operators for our large computer centre in the City which comprises a dual configuration 158 and a 3031, together with PDP machine. A three shift system is operated covering a five day week.

You must have O levels and at least two years' experience on large IBM 370 machines, which includes a full working knowledge of the VS1 operating system and JCL. If you are familiar with VM/CMS and dual configuration operating techniques, so much the better.

We offer an attractive salary, four weeks' holiday, non-contributory pension and life assurance schemes and LVs.

Please contact Barbra Coulston on 01-588 2355 Ext. 683 to arrange an interview or write to her at the Personnel Department, The Stock Exchange, London EC2N 1HP.

The Stock Exchange

SYSTEMS ANALYSTS (to £6,500)

The installation is the computer services division of a well-established packing group. A major expansion phase has been entered utilising advanced ICL hardware/software. As a result we have a limited number of opportunities for Systems Analysts.

The successful applicants will join project teams working on new and exciting systems for all UK locations. Distributed techniques will feature heavily in all developments utilising intelligent terminals which will link to the computer centre. There are excellent opportunities for Systems Analysts who wish to develop their experience, particularly in the production area. Candidates should have a financial or industrial systems background. Also Trainees with the above background will be considered. Knowledge of ICL equipment is not essential.

In addition to working in a rapidly expanding department, you will have a 35 hour week, 4 weeks' annual holidays, pension and free life assurance schemes.

To find out more details write, including brief career details, to either:

Mr M. Honeyball or Mr W. Everest
METAL CLOSURES GROUP LIMITED
Barnet Road, London Colney
Tel: Bowmansgreen 25000

HIGHLAND HEALTH BOARD
Treasurer's Department

SENIOR ANALYST/PROGRAMMER

Salary Scale: £5,537-£6,716

Applications are invited for the above post in the Computer Services Unit of the Treasurer's Department which is situated in the grounds of Hilton Hospital at Inverness.

The current workload encompasses a wide variety of financial together with some medical applications all of which are processed on an ICL 2904 computer.

Applicants should have at least five years' relevant experience and be conversant with ICL Cobol and Software.

The successful applicant will be responsible to the Computer Manager for detailed system and programming work both in developing new systems and maintaining existing ones.

Application forms and further particulars may be obtained from, and should be returned to the Personnel Officer, Highland Health Board, Reay House, 17 Old Edinburgh Road, Inverness IV2 3HG, not later than 8 December, 1978.

DATABASE

SENIOR DATABASE ADMINISTRATORS & DESIGNERS— LONDON & EUROPE

The U.K. and European divisions of a U.S. public Corporation have openings in their London and Zurich offices for Senior Database Administrators, Designers and Applications personnel with extensive Database experience using any of the proprietary DBMS currently in use on major main-frame and mini systems. Of particular interest are persons with expertise in IMS, TOTAL, ADABAS, DMS, IDMS, etc. Hardware backgrounds are of little importance — what is essential is the depth of experience in your relevant area of Database expertise. Our client is anxious to maintain their prestigious standing world wide by attracting proven and potential talent to join them in the development of advanced Database projects in commercial and technical environments.

Grade I Salaries: £9-£10,000 p.a.
Grade II Salaries: £7-£10,000 p.a.

The opportunity to travel within Europe and the U.S. is available. Interviews will be held in London during the next three weeks.

MATRIX

Telephone: 01-[illegible] 360 Oxford St., London [illegible]

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

COMPUTER PROGRAMMER

Applications are invited for a post as Computer Programmer in the Optics Section of the Blackett Laboratory. The successful candidate will be associated with a theoretical research group working in laser physics and his principal task will be to design and operate Fortran programs on the College's CDC 6400/6600 computer facility. Applicants should preferably hold an honours degree in mathematics, physics or computer science and previous experience in Fortran programming would be an advantage. The appointment will be for two years. Starting salary will be from £4110 including London Allowance.

Applications, together with at least two references, should be sent to Dr D. H. C. New, Optics Section, Department of Physics, Imperial College, London SW7 2BZ to arrive before 27th November.

MINI COMPUTER PROGRAMMERS

Can you write operating systems?

Do you have experience of any mini computer assembly language and of an Algol like language?

If so please phone Owen Rees on Cambridge (0223) 312347 or write to him at:
Toltec Data Ltd.,
24 Thompsons Lane
Cambridge CB5 8AQ

FULL TIME TUTORS REQUIRED

International training organisation, due to expansion within the tutorial department are seeking three additional tutors to teach T.O.P.S. and privately sponsored students in computer operating and programming.

We envisage a minimum age of twenty-five years and at least two years in computer programming or operations and preferably with a teaching background.

[illegible]

Telephone: Mike Grosse on 01-388 0691 or write in the strictest confidence to:

COMPUCENTRES LIMITED
North Wing, Drayton House
Gordon Street, London W.C.1

STRATHCLYDE REGIONAL COUNCIL

GLASGOW SUB-REGION
Roads Department

SYSTEMS DEVELOPMENT OFFICER

Viceroy House, India Street, Glasgow
Salary Scale: APV £5568-£6066*

Applications are invited from persons with a Degree in Computer Science, Mathematics or Engineering for the above post in the Design and Construction Section at Headquarters. The successful applicant will be required to have considerable experience of Honeywell Systems in the use of computer applications for highway and structural design and management systems. Duties will include assisting users with applications and developing new techniques.

*This salary range is inclusive of supplement.

Application forms may be obtained from: The Assistant Director of Manpower Services, 21 Gordon Street, Glasgow G1 3PS, to whom completed [illegible] quoting Ref. G677, should be returned by 7th December, 1978.

R. M. O. McCulloch, Director of Manpower Services

KENT COUNTY COUNCIL

HIGHWAYS & TRANSPORTATION DEPARTMENT

COMPUTER PROGRAMMER

£3279-£4146 (inclusive)

In the Highways Laboratory: The work of the section involves the development and running of computer programs particularly in connection with the analysis of data from site instrumentation and road maintenance surveys. At least one year's experience in writing programs in FORTRAN and BASIC is essential. HNC in Computer Studies advantageous.

The holiday entitlement is 18 working days and a system of flexible working hours is in operation.

For further details phone Mr E. D. Lawrence or Mr C. D. Hallam, Maidstone 77733 ext. 267.

Application form returnable by 11 December from the Highways Laboratory or Personnel Officer, Kent Highways and Transportation Department, [illegible] House, Lower Stone Street, Maidstone. Ref. P.4281/CW.

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You are a programmer able to discuss and design solutions for clients and then implement them because your experience includes assembler and high level languages together with a sound understanding of the commercial applications of small business systems.

Your present company provides you with a good salary, a car and a package of benefits — *but does it really distribute all of the profit entirely to employees?*

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459 Bath Road
Slough SL1 6AA
Tel: 06286-65232

Ring and ask for Ian McEwan who will provide you with information, assess your experience and immediately arrange an interview.

THE PERFORMING RIGHT SOCIETY LIMITED

requires a

PROGRAMMING CONSULTANT

Reporting to the Systems and Programming Manager. His/her duties will include:

- Assisting Systems and Programming project team personnel in the development and maintenance of new and existing systems.
- Maintaining all standard utility programs and associated documentation.
- Scheduling program testing on the computer and vetting same on behalf of Systems & Programming personnel.
- Editing and maintaining the Programming Standards Manual, and any related literature.
- Appraisal of proprietary and other software for use on our ICL 2960/DME computer.

He/she should have extensive PLAN and disc experience and also possess a sound working knowledge of COBOL. Experience in communications application programming would be an advantage.

The salary will be within the range £4,500-£7,056 according to experience.

COBOL PROGRAMMERS

With 1-2 years' experience, to work in small and friendly teams of experienced programmer/analysts, using the Society's 2960/DME Computer.

The salary will be within the range £3,497 to £5,486 depending on experience with excellent opportunity for further advancement.

The Society offers a number of fringe benefits including LVs, flextime, mortgage assistance (after a qualifying period), 4 weeks' holiday and a staff restaurant.

Please contact:

Personnel Manager
The Performing Right Society Limited
29/33 Berners Street, London W1P 4AA. 01-580 5544

THE LONDON HOSPITAL MEDICAL COLLEGE
(University of London)

COMPUTER PROGRAMMER

Applications are invited for the post of Programmer in the Computer Section from Programmers with at least one year's experience.

The computer section provides an advisory and programming service to the staff and students of the Medical College. A PDP 11/10 is used both as a local computer and as a terminal to the University Computers. Experience of using FORTRAN is essential. Knowledge of SPSS, BMD and PDP-11 assembler would be an advantage. Salary will be at a point on either Programmer 18 Scale (£3,384-£5,604 + £354 London Allowance per annum) or Programmer 17 Scale (£[illegible]-£6,555 + London Allowance per annum), according to qualifications and experience. Enquiries to Mr S. Evans, 01-377 2566. Applications to The Secretary, The London Hospital, Medical College, Turner Street, London E1 2AD.

UNIVERSITY OF KENT AT CANTERBURY

RESEARCH FELLOW IN DISTRIBUTED COMPUTER SYSTEMS

Applications are invited for the above position in the Electronics Laboratories.

The successful candidate will work on an SRC-supported project investigating the realisation of an interactive knowledge base on a distributed computing system (consisting of eight LSI-11 micro-processors).

Candidates should hold either a Doctorate or a good honours degree supported by significant research/industrial experience. Demonstrated expertise in advanced software is essential.

Salary will be on the scale £3883-£6585 and the post will be tenable for three years.

Application forms and further details are available from the Senior Assistant Registrar, Faculty of Natural Sciences, The University, Canterbury, Kent CT2 7NH to whom applications should be returned as soon as possible. Please quote ref. A41/78.

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This major manufacturer of electronic communications equipment is ahead of the field and intend retaining their place as world leaders.

To help take them into the eighties they are looking for some new key people.

Software Engineers,

You'll be developing programmes for digital electronic systems involving the use of mini-computers and micro-processors in a real time environment,

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Programmers to £6,500

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- ★ 370/138 HARDWARE WITH DOS/VS + POWER/VS.
- ★ ON-LINE PROGRAM DEVELOPMENT—USING SPMOL.
- ★ TELEPROCESSING—CICS/VS FOR 50 x 3278 V.D.U.s.
- ★ DATABASE—DOS DL/1.
- ★ NEW PROJECTS—FOR THE INSURANCE INDUSTRY.
- ★ FRIENDLY ATMOSPHERE—IN A SMALL BUT LIVELY TEAM.

INTERESTED?

Then if you have sound PL/1 experience or you are a COBOL programmer wishing to learn PL/1.

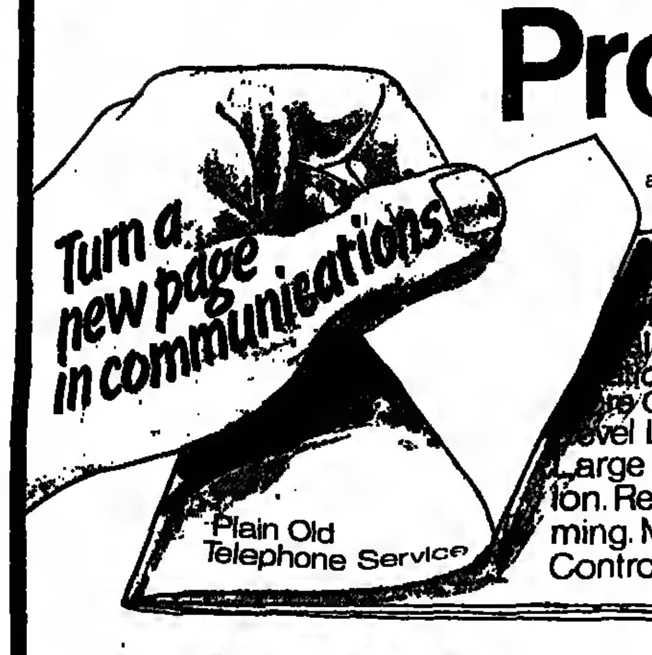
Ring for an application form on:

01-836 7376

or write to **Roger Foord** at:

The Policy Signing & Accounting Centre Limited
Temple Station Buildings
Victoria Embankment, London WC2R 2PJ

Software Engineers Programmers



By leading or joining one of our [illegible] teams you will have the opportunity to participate in the design of [illegible] [illegible]

Immediate vacancies are for team leaders and programmers with a strong technical programming background [illegible] [illegible] For further information and details of specific vacancies, please telephone [illegible] or write to [illegible], Standard Telephones and Cables Limited, Oakleigh Road South, New Southgate, London N11 1HB

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Burroughs	6700	COBOL
IBM		MTCS

Top rates — weekly paid

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Cray Research (U.K.) Ltd now has vacancies, due to continued growth for Senior Technical Engineers

These posts entail site maintenance down to component level of the Cray Research (U.K.) Ltd. now has vacancies, due to continued growth for Senior Technical Engineers

The applicant should have previous maintenance experience and the ability to fault find to components level under their own initiative. Shift work and overtime are envisaged

These jobs are primarily based in the Reading area, but vacancies in the North may arise in the near future

Product training will be given to successful applicants, a portion of which will be in the U.S.A.

These posts carry good salaries together with a company car and an excellent benefits package. So, if you are interested in joining a rapidly growing world leader in computing write to.

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Or telephone him on Bracknell 21515

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We need highly motivated Customer Service Engineers with significant experience on state of the art products, preferably advanced microprocessor based equipment.

Since you will be working largely on your own initiative, it is important that you REALLY CARE about the standard of service you give to our demanding users.

An excellent remuneration package includes a new estate car.

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Delta Data Systems Ltd
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OR

£6,993-£7,506 (NJC Grade 9)

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If you're an ANALYST with at least 3 years' systems experience you may fit the bill. The opportunity exists to grow with an expanding department and to gain experience of T/P and Database techniques — it'll be up to you to make your mark! Don't worry if your experience is not with Honeywell — we'll train you.

The installation comprises a dual Honeywell 66/10 with 384K words of memory, 2,600 megabytes of exchangeable disc storage, tapes, printers and a major network of terminals based on Incoterm's 2D/3D controllers.

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The Authority offers excellent conditions of service and generous removal expenses if relocation is necessary.

If you're interested or want to know more about this opportunity, why not call Jenny Spencer at Huntindon (0480) 56181 ext. 370 for information and an application form.

The closing date for applications is December 15th, 1978, and should be sent to:

ANGLIAN WATER AUTHORITY
Brook House, Ouse Walk, Huntingdon, Cambs.

CAPITAL APPTS.

FORTRAN

Programmers urgently required for Industrial and Scientific Development £3,600-£8,000.

ALL AREAS

Phone for free list of vacancies

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637 5551 day, 636 9659 eve.

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Application form from Personnel Officer (Technical Staff AK4), University College London, Gower Street, WC1E 6BT, from whom further particulars are available.

INSTITUTE OF GEOLOGICAL SCIENCES

APPLICATIONS PROGRAMMER

The Institute has a vacancy for an Applications Programmer in its Computer Unit in Edinburgh. Duties will involve programming and data handling in connection with a data base of geological and geophysical data installed on an in-house PDP-11/45 computer. Experience of computers and knowledge of Fortran is required and familiarity with PDP-11s or some knowledge of geology would be an advantage.

QUALIFICATIONS AND AGE

Applicants should normally be under age 30 and have a degree or equivalent in an appropriate subject. Appointment will be at Scientific Officer or Higher Scientific Officer level depending on qualifications and experience.

SALARY

Scientific Officer	£2839 - £4415
Higher Scientific Officer	£4101 - £5448

Starting salaries may be above the minimum. Non-contributory pension scheme. The staff of the Council are not Civil Servants but their pay and conditions of service are similar to those of scientists in the Civil Service.

For an application form, to be returned by 11th December, 1978, write to: Recruitment Section, Institute of Geological Sciences, Exhibition Road, London SW7 2DE.

Please quote reference SO/CU/78/1.

NATURAL ENVIRONMENT RESEARCH COUNCIL

Response...Ability

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Directors I. W. Norton, J. M. Norton

19th October 1978

Owen Kelly Esq.,
Computer Weekly
Statham House
Talbot Road
Manchester

Dear Owen,

As recruitment consultants are known to complain when response to advertisements is poor, I thought it only right to drop you a line to say how successful our recent advertising has been using Computer Weekly.

As you are aware, at the present time, suitable candidates for vacancies are in short supply, but despite this we have, in recent weeks, received good response to our advertisements and as a result we have placed a significant number of candidates with our clients.

I look forward to continuing the successful relationship with yourself and Computer Weekly.

Kind regards,

Yours sincerely,

IVOR NORTON
Managing Director

IWN/kme

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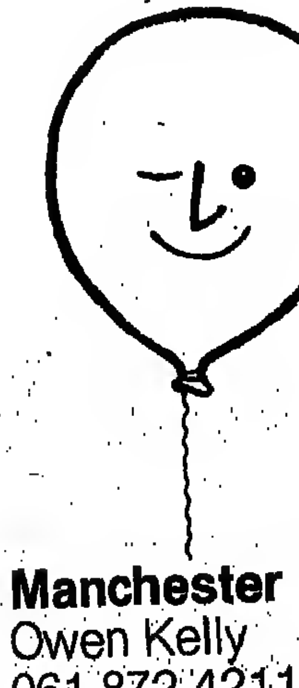

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Chris Prier	Basil McGowan	Owen Kelly
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COMPUTER WEEKLY

The natural jobs market place for the whole computer industry

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Sales Opportunities Data Transmission

Racal-Milgo Ltd., is an established world leader in the field of data transmission [illegible]. The company has recently extended its activities with the creation of the Voice Response Division [illegible] computer controlled voice response systems for data entry and file enquiry [illegible].

First class sales opportunities now exist with both the Company's new and existing products.

Sales Executive
To sell the Voice Response Division's new equipment.

Proven sales ability is essential and ideally candidates will have a background in the [illegible] consultancy, bureaux or hardware/software sales and be able to [illegible].

Sales Engineer
To sell the Company's comprehensive range of data communications equipment within a [illegible] territory which includes SW London, Surrey and West Sussex.

Proven sales ability in the Communications field is essential [illegible] and exceeding targets.

Both positions carry attractive basic salaries, a Company car, [illegible] rewarding commission scheme based on sensible targets.

Other benefits will include generous leave entitlement and membership of [illegible] pension scheme with free life assurance.

RACAL

Ring for an application form, or write with details of age, qualifications and experience to:
D. J. Kichenside, Personnel Officer, Racal-Milgo Limited,
Prospect House, Thorn Street, Reading, Berkshire. Telephone Reading [illegible]

Senior Analyst/Programmer

C. £5,000+£5,500

Exceptional career prospects, working conditions and fringe benefits are offered by this appointment with Brown Brothers Ltd., suppliers to the motor trade through a nationwide distributor network.

Part of a group with international affiliations, the Company is prosperous, and expanding steadily in a buoyant market. Top management is young, lively and go-ahead.

If appointed, you will join a small, friendly team of Programmers at our Swindon H Q. Your responsibilities will encompass support and maintenance of Order Processing, Ledger and Management Information Systems, and a warehouse system based upon a mini computer. Projected new applications for our IBM 370/138 include Fixed Asset Accountancy, Purchase/Ordering and expansion of the CICS-based on-line system.

You will need at least 3 years' experience as an Analyst in a commercial environment and, preferably, COBOL experience.

BROWN BROTHERS

For further information please write to The Personnel Director, Brown Brothers Ltd., Great Eastern House, Greenbridge Road, Swindon, SN3 3LB.

Europe's largest automotive wholesalers.

NEW ZEALAND

Applications are invited for the following positions with AHI Computer Services in Auckland, New Zealand:

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CHIEF PROGRAMMER (PL/1)
£6K-£7K

SENIOR PROGRAMMER (PL/1)
£5K-£6.5K

PROGRAMMERS (x 2)
£4.5K-£5.5K

THE COMPANY:
AHI Computer Services is a member of the Alex Harvey Industries Group of companies. We currently operate an IBM 370/145 using DOS/VS and CICS/VS plus an HP3000 to support our nationwide teleprocessing network.
Programming is in PL/1 on the IBM and COBOL on the HP3000.

CONDITIONS:
Appointees will be required to emigrate to New Zealand. All emigration expenses will be paid by AHI Computer Services. Interviews will be conducted in London by a representative of AHI Computer Services during Late January early February.

APPLICATIONS:
Written applications containing personal details plus a full resume of experience should be airmailed to:

The Manager
AHI Computer Services
PO Box 12051
Auckland
NEW ZEALAND

ADVERTISEMENT

ANALYST/PROGRAMMERS

to £7,200 (HAMPSHIRE)

The opportunity exists to join a fast-growing, hard-working group of young professionals specialising in providing data processing services to the insurance industry.

The people we hope will join us should have:

- experience in RPGII or COBOL, preferably with some knowledge of small business machines and/or insurance applications.
- a willingness to travel and undertake individual responsibility, together with a good team spirit and an adaptable personality.

In return the company offers a professional yet informal working environment with flexible hours of work, pension scheme, bonus scheme and generous removal expenses.

Please call or write to:
Nick Bird, R. A. Williams (Systems Consultants) Ltd.
Joule House
St. James Road, Fleet, Hants
Tel. Fleet (02514) 5776 or 28021

SYSTEMS ANALYST

UP TO £7½K

is required by Barclays Unicorn Group Ltd., a leading Unit Trust and Life Assurance Company, at their East London Head Office.

The position requires a person of team leader calibre with the ability to motivate other people. The analyst will be responsible for the development of commercial systems to support the expansion of the Life Assurance side of the Group's operations.

We use an ICL 1904A operating under George III while the installation of a large mini-computer is planned for mid 1979. A changeover to an ICL 2900 system is being considered for installation within two years.

The successful applicant will need at least 2 years systems experience and will probably have a sound commercial background. Knowledge of ICL 1900 Disc and Cobol and Life Assurance systems will be a distinct advantage. He/she will be seeking to enlarge his/her experience in a financial environment and to be in a position where practical ideas can be put to good use.

The salary range is £6-£7½K plus productivity bonus. As a Barclays Bank employee, conditions of employment and fringe benefits include Luncheon Vouchers and a Staff Restaurant, Profit Sharing, non-contributory pension scheme, 5 weeks' holiday and low interest mortgages and loans.

B. L. T. Parker, Administration Manager
BARCLAYS UNICORN GROUP
252 ROMFORD ROAD, LONDON E7 9JB

BRITISH ANTARCTIC SURVEY—CAMBRIDGE

SCIENTIFIC OFFICER/ HIGHER SCIENTIFIC OFFICER

(PERIOD APPOINTMENT)

The Atmospheric Sciences Division of the BAS requires a Scientific Officer or Higher Scientific Officer to be responsible for the reduction and publication of data collected by the Survey's three geomagnetic observatories in Antarctica. In addition the duties would include giving support to research staff using geomagnetic data, and maintenance of equipment.

Experience in computing is desirable. The appointment is for three years.

Qualifications:
For appointment to Scientific Officer, a degree, HNC or equivalent and for appointment to Higher Scientific Officer, at least five years relevant experience.

Salary and Conditions: Scientific Officer, £2838-£4416 per annum
Higher Scientific Officer, £4101-£5448 per annum

Starting salaries may be above the minimum according to age and experience.
Staff at the NERC are not Civil Servants but their pay and conditions of service are similar to those of the Civil Service.

For application forms please write (quoting reference BAS/S2) to:
The Establishment Officer, British Antarctic Survey, Madingley Road, Cambridge CB3 0ET.
Closing date: 11 December, 1978.
NATURAL ENVIRONMENT RESEARCH COUNCIL

SENIOR SALES EXECUTIVES

Mainframe Computers

Our client is a major international mainframe manufacturer with a highly respected reputation for producing some of the industry's most cost effective computing equipment.

We are seeking senior sales executives with a proven record of success in selling mainframe computer systems, and already earning a five figure income. Our client's existing sales executives typically enjoy incomes around

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These job opportunities provide many significant benefits:

- REAL SCOPE FOR INDIVIDUAL SKILLS AND CREATIVITY WITHIN A FLEXIBLE AND IMAGINATIVE MANAGEMENT ENVIRONMENT.
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Please supply comprehensive career details to:
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088922281

A SALES and MARKETING SERVICES COMPANY

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Europe's leading computer and digital systems monthly magazine — Systems International — needs a young, imaginative and technical writer to join its lively team based in South London. He/she will be expected to generate articles on computer topics so some knowledge of the computer industry is required.

Apply to Frank Booty, Editor, Systems International, Dorset House, Stamford Street, London SE1. Tel: 01-261 8011.

COBOL Programmers

Let's talk about success -yours and ours!

There's a lot we could say about the areas of computing in which we lead the world – large-scale computers, computer peripherals, computer consumables, computer-based education and, of course, computer services. However, we recognise that the success of a company is only relevant to the employee when it directly effects his or her career and financial situation.

When we talk about success we refer to facts like our commercial systems and programming department having expanded from 17 to 35 within the last year. Three new management positions have been created and existing staff have been promoted within the same period. Expansion has necessitated the installation of an IBM 3031. This, and many more employee opportunities to follow, is the result of our rapid and continuing growth.

Ours is not run-of-the-mill programming, it is stimulating work involving all aspects of industry and commerce. Personal progress is not left to chance either, ongoing education is a commitment at Control Data, not a rumour.

So if you really care about your future, and have more than two years experience of Cobol (any computer!), wish to work in the LONDON area and a salary range of up to

£7,000

matches your immediate requirements, contact us right away.

Success could be as far away as your telephone!

CONTROL DATA
MORE THAN A COMPUTER COMPANY

Magnetic Media Manufacturing Division

Please supply your career details to:
Caroline Connabeer, Reference DP 1178, SMS Sales and Marketing Services Ltd., 4 Tavistock Place, LONDON WC1H 9RA.
Telephone: 01-837-2281.

TECHNICAL SUPPORT STAFF

LEICESTER BUILDING SOCIETY
OADBY, LEICESTER

Our Computer Department is looking for staff for a new Technical Support function.

The present installation consists of a twin Burroughs B3700 system at the centre of an expanding nationwide Data Communications network. It is planned to transfer operations to a dual B6800 system using an on-line data base.

The main requirement will be to ensure the successful implementation of the Data Base and Data Communications network, and monitor the performance of computer systems.

Applicants should preferably have sound experience of Data Base techniques and/or Data Communications, together with some systems design and programming knowledge. While knowledge of ALGOL and experience of Burroughs GEMCOS, NDL, DMS II software would be particularly useful, it is not essential as training will be given.

Salary will very much depend on the experience and expertise that can be offered.

CONDITIONS OF EMPLOYMENT ARE EXCELLENT WITH BENEFITS WHICH INCLUDE CONCESSIONARY MORTGAGE INTEREST RATE. RELOCATION ASSISTANCE WILL BE PROVIDED WHERE NECESSARY.

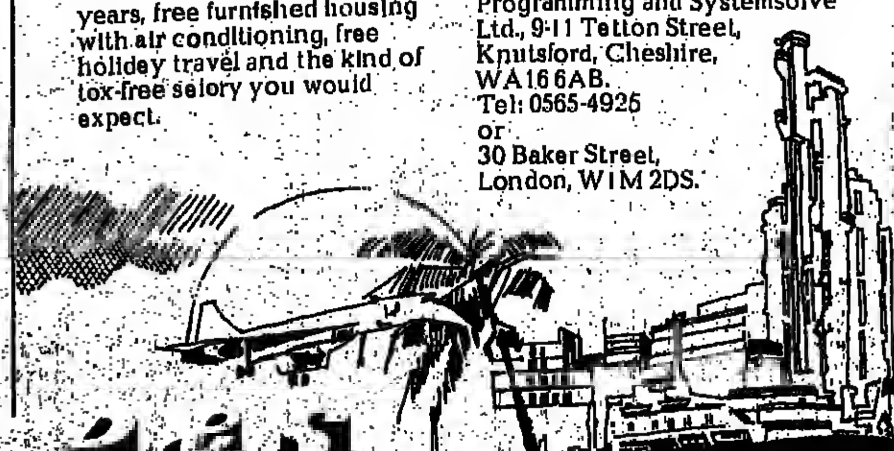
APPLICANTS SHOULD STATE PERSONAL DETAILS, CAREER HISTORY AND PRESENT SALARY, IN WRITING TO: ASSISTANT PERSONNEL MANAGER, CHIEF OFFICE, LEICESTER BUILDING SOCIETY, OADBY, LEICESTER LE2 2PF.

It's all happening in the Middle East

Exciting ground floor opportunities are awaiting Project Leaders and Programmers in the Middle East.

The high rewards include a minimum contract for two years, free furnished housing with air conditioning, free holiday travel and the kind of tax-free salary you would expect.

Project Leaders and Programmers with high and low level language experience, accessing of data banks, and forecasting, should apply in the first instance to:
Programming and Systemsolve Ltd., 9-11 Tatton Street, Knutsford, Cheshire, WA16 6AB.
Tel: 0565-4926
or
30 Baker Street, London, W1M 2DS.



PL/1

COMMERCIAL PL/1 PROGRAMMERS, ANALYST/PROGRAMMERS & DESIGNERS 370/ms

International company requires PL/1 programmers for the following U.K. locations: Central London, Herts., Hants, Bucks. and Cheshire. Applications are commercial and the hardware is IBM 370/145 & 158 under SS DOS/VS programmers will also be considered if they are prepared to switch to SS. The client wishes to recruit project leaders, analyst programmers, senior and junior programmers. 2-7 years PL/1 is required within a commercial environment. Some positions could involve U.K. travel. Salaries will be above average and dependent on experience.

Project Leaders £5.5-£5,750 p.a.
Analyst Programmers £6-£7.5K p.a.
Senior Programmers £5,900-£7,000 p.a.
Programmers £5-£5,250 £5.5-£7K p.a.

Database and on-line applications experience would be considered very advantageous but in any event training will be given to sound Batch-oriented programmers. The company operates a flexitime system and will pay relocation expenses where applicable. Interviews will be held in London as soon as applications are received and offers made within 7 days.

MATRIX

Telephone: 01-491 4636 (10 Lines)
360 Oxford St. London W1N 9HA.

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Experienced programmer required to assist in implementing a sophisticated interactive text-manipulation system using a 16-bit microprocessor programmed in assembly language and BCPL.

The successful applicant's programming experience is more likely to have been gained in an academic than a commercial environment. He/she will be self-motivating and wanting to work with minimum supervision. Starting salary according to experience in the range £5,000 to £7,000 p.a. Advancement on the basis of achievement and demonstrated potential, salary review 6 months from joining. Year end bonus scheme.

For application form and further details write to Graphical Software Limited, 5 Salisbury Villas, Station Road, Cambridge. Telephone 0223 [illegible]
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THE SALES BIT

Where sensitivity really counts

I HAVE often used the term "buyer" in this column. As far as I am concerned it does not necessarily refer to someone within a buying department, but rather to any person who buys (ie, makes the decision to purchase).

Buyers and salesmen not only exist at all levels of age, experience and seniority, but also with a wide range of individual moods and attitudes. If a satisfactory ongoing business relationship is to exist between these two parties, then it must be a well balanced interaction. It is therefore the salesmen's responsibility to adjust his approach to each buyer in order to ensure that such a balanced relationship is established. If he becomes subdominant he will lose respect; if he becomes dominant he will be regarded as insensitive to the buyer's needs; if he does not exhibit due deference to any gap in age status or experience between the buyer and himself he may be considered disrespectful.

This type of situation is where "sales sensitivity" really counts.

Here are a few samples of buyer attitudes, most of which I am sure you will recognise, with some brief comments.

Perhaps you will consider your own methods for handling the following characters.

THE BUSY BUYER

I don't mean the classic "Something just cropped up. I can only spare you 50 microseconds". In that case the salesman should just make another appointment and get out. No, I mean the buyer who is prepared to hear the whole story, but he has too much else on his mind — telephones constantly ringing, heads around the door, and so on.

This situation must be kept brief and simple. It is also a good idea for the salesman to let it be known that he is sympathetic towards the buyer's busy situation and will consequently condense his presentation and quickly get to the point.

THE MATEY BUYER

A good relationship between the salesman and the buyer is conducive to good business, but one that is too familiar becomes an obstacle.

Two approaches that can add discipline to this situation are a constant awareness of the need to keep the conversation on the business topic and also using the "trial close" at every opportunity as a constant reminder of the salesman's primary intention.

THE HESITANT BUYER

This type of buyer is usually both indecisive and insecure, which means he needs help without patronising [illegible] without being drowned in chauvinism.

The salesman should make his points simply and clearly by declaring the advantages and benefits directly related to the buyer in an uncluttered manner, omitting all peripheral and intangible claims.

THE AGGRESSIVE BUYER

"Keep your cool" is the prevailing message. The salesman should view this kind of buyer with the calm detachment of a bystander and avoid any possibility of direct involvement in the source of aggression.

Why should the buyer be aggressive, even angry? Maybe the salesman offended him? So, he should ask and apologise in advance. That usually results in an immediate modification of attitude.

THE DISORGANISED BUYER

Judging the best time to call is usually the most effective way of handling this type of buyer. First thing in the morning is the best time, before he gets immersed in the problems of the day, or in the evening after the telephone stops ringing.

From the selling angle the salesman needs to take whatever steps are necessary to hold constantly the buyer's attention. Summarise step by step and trial "close" at every stage of the negotiation. Written confirmation of all items agreed is essential.

THE AUTOMATIC BUYER

As with the "aggressive" buyer, a calm detachment is essential. A totalitarian typically despises subdominance as much as he hates opposition. Therefore the salesman is obliged to show respect for the buyer's status, but at the same time handle all the questions that confront him with confidence and authority.

The biggest mistake the salesman can make with this kind of buyer is to pick a fight or attempt to embarrass him.

THE 'KNOW-ALL' BUYER

Contradiction is anathema to this character. One sure way to lose the business is to tell him he is wrong. On the other hand, I believe it is the salesman's responsibility to provide the means whereby the arrogant buyer informs himself of his own ignorance. "I'm sure you're right. I'll get our technical department to send you some details so you can confirm it for yourself!"

Above all, the salesman must know his product and be well prepared for such a meeting. His presentation should be planned and fluent. He should avoid verbosity and listen carefully, making notes where pertinent. All follow-up action, either written or verbal, should be precise.

TRADER

HEX PAUSES
Because of pressure on space The Hexadecimal Kid is taking an enforced rest this week.
He'll be back!

Puzzle Answer

942 + 942 + 942 = 1,413 + 1,413

JUNIOR PROGRAMMER

£4,500 — S.E. LONDON

If you have only just started as an RPGII programmer, this company will be interested in you. They only require six months experience on System 3. They offer help with relocation expenses and other company perks. You will help them in developing a new order entry and sales ledger system (we also have three companies in the city looking for more experienced RPGII programmers).

CW46/1 Michael

OPERATORS

£5,000 Inc. — FELTHAM

Do you like bureaux work? Good, then this ICL GII and GIII installation will attract you 3 shift system and 21 days hols., etc.

CW46/2 Patricia

OPERATORS

c. £5,800 Inc. — VICTORIA

If you have 18 months IBM OS experience, this commercial company will be interested in you. They have a 370/145 plus TP 3790's. Interesting 12 hour shift system allows generous time off. Lots of nice perks too.

CW46/3 Tricia

OPERATORS/SENIOR OPERATORS

To £4,200 Inc. — NR. MILTON KEYNES

A major engineering firm (offering an excellent relocation package) wishes to recruit several ICL GII or GIII operators. Other top perks include excellent training, 4 weeks hols and non C.P.S., with prospects of programming eventually.

CW46/4 Tricia

OPERATOR

£4,700 Inc. — W1

A 2 shift IBM DOS/VS GRASP system — just right for you! This progressive International company offers terrific perks such as free lunches, non-CPS plus excellent training facilities.

CW46/5 Tricia

JUNIOR SYSTEMS ANALYST

c. £5,000 — N.W. LONDON

A major construction company with a small but powerful ICL installation requires a systems analyst with a programming background to work on a variety of commercial and engineering applications. Nice perks.

CW46/7 Michael

JUNIOR PROGRAMMERS

£3,000 to £4,300 — S.E. ENGLAND

You have only 1 year's commercial experience? Then you are in great demand. We have a large selection of first-rate companies who need people like you. Some offer mortgage assistance to the right candidates after short period with them

CW46/8 Tricia

PROJECT LEADER

c. £7,000 — BRENTFORD

If you want to go into new project work and have implemented at least one major project yourself, now is the chance to change. Gillette Industries offer an excellent working environment plus 5 weeks holidays, annual bonus plus other company perks. All you need is a manufacturing Industry background, and hopefully, but not essentially, IBM experience.

CW46/9 Michael

FREELANCE PROGRAMMERS

To £360 p.w. — UK & OVERSEAS

IBM	Cobol DOS	Croydon	3 months
ICL	Cobol 1900/2903	City	4 months +
ICL	RPG II AN/PROG	Reading	3 months
PDP/11	Basic + RSX11	C. London	6 months +
PDP/11	Fortran RSX11	Belgium	6 months
IBM	Systems Analyst	IMS. D.C. Berks	3 months

Apply NOW for the latest vacancies. IBM, HONEYWELL, DEC & ICL programmers welcome. Earn a Xmas holiday paid break plus an attendance BONUS. Ask for the Contracts Officer on 01-995 4148. Irene. CW46/6

MINI COMPUTER PROGRAMMERS

£4,000 to £[illegible] — [illegible] & HOME COUNTIES

[illegible] ... to code or [illegible] ... held is open [illegible] ... W. London, [illegible] ... in this rewarding [illegible] ... the MINI-computer [illegible]

CW46/10 Michael

DEC PROGRAMMERS

£4,500 to £[illegible] — [illegible] & HOME COUNTIES

We [illegible] ... and 24 Software Consultancy [illegible] ... with 18 months or more experience. [illegible] ... about your chance [illegible] ... experience are added pluses.

CW46/11 Michael

SENIOR SYSTEMS ANALYST

c. £6,500 — NR. HERTFORD

This organisation is involved in the [illegible] business and therefore can offer some generous [illegible]. They have a large IBM installation and require people with commercial experience to work in new and existing projects. Lovely area to work in.

CW46/12 Michael

SENIOR CONSULTANTS

£0,500 to £12,000 — CENTRAL LONDON

Six large, well established consultancies [illegible] to recruit systems people with all round experience [illegible] equipment and the right personality to deal with clients [illegible] first-rate service. Technical Communications Consultants are also required where in-depth implementation experience of IBM or ICL latest ranges are essential. Excellent [illegible] prospects.

CW46/13 Michael

Recruitment Consultants

UNIVERSAL COMPUTER ASSOCIATES LIMITED

Data Express House, 3 Prospect Place, Heathfield Terrace, Chiswick W.4

01-995 3883 (01-958 6138 EVENINGS)

Philips Data Systems

a division of Philips Electronic Industries

offers international opportunities for

Software Development and Support Specialists

Experienced up to £12,000p.a.

Graduates from £6,000p.a.

Philips Data Systems wish to recruit for their Headquarters in Holland, and for their other locations in Holland, France and Germany, experienced Software Engineers and Graduates in computer science, mathematics and engineering.

Systems Software Designers and Developers

The work involves specification, development and design of new software products in the following areas:

- Transaction orientated operating systems
- Real time operating systems
- Data management and data base management systems
- Data Communications
- Distributed systems, network development
- Programming languages, compiler construction

Application Software Experts

Experts can be assigned to one of the following activities:

- Investigation, specification and implementation of application software development methods
- Application research
- Application orientated systems software evaluation
- Coordination of application package development
- Network assignment coordination in customer projects

Software Support Experts

Support people are assigned to the following subjects:

- Release preparation
- Support of sales organisations throughout the world
- Problem solving
- Quality control
- Advising of development departments on usability
- Pre-sales support
- Evaluation of new products

Salaries, of up to £12,000 are negotiable for experienced candidates, depending on ability, expertise and location, and new Graduates in computer science, mathematics or engineering, can expect starting salaries of £6,000+. All salaries are reviewed annually.

First class benefits include Pension Plan, Health Insurance, and generous assistance with housing and relocation expenses. There are excellent opportunities for transfers worldwide throughout the Philips Organisation.

PHILIPS

Applications including a full C.V. and quoting reference IO/c.w. should be sent to John Higgins, Personnel Manager, Philips Data Systems, Elektra House, 2 Bergholt Road, Colchester, Essex CO4 5BE, and applicants should note that initial interviews will be held in the UK and final interviews in Holland. If required further details concerning these appointments can be obtained from Mr P. C. Hölscher at Apeldoorn in Holland on 010 31 55 230123.

PHILIPS Data Systems

SO YOU'D LIKE TO BE TRAINED IN DATABASE TECHNIQUES TERMINAL BASED SYSTEMS ADDITIONAL LANGUAGES BUSINESS ANALYSIS CUSTOMER LIAISON PROJECT CONTROL TIME SHARING MARKETING £7,000

Then we need to talk in London

Nine years ago a subsidiary of one of Europe's most successful multi-national companies entered the highly competitive computer services market.

Since then the Company has grown to be one of the most significant forces in the computer services industry in the United Kingdom. Based on substantial computing power and data centres throughout England they provide a comprehensive range of services – Batch/On-Line/RJE/Time Sharing – to a broad base of "Blue Chip" corporations and Government departments.

Having experienced an extremely successful year they are stepping up their thrust into the market with impressive and extremely competitively priced systems. As a result they wish to augment a number of teams in the LONDON area.

Project Leader

To qualify as a successful candidate you will probably be a Programmer/Analyst, competent in COBOL, PL1 or ASSEMBLER, and capable of controlling a small Project Team.

You will initially be responsible for the development of commercial and management information systems using a range of languages and company products – including database systems.

Senior Programmers

Potential Team Leaders with three to four years commercial programming experience (languages as above) self-motivated and capable of carrying through small projects without supervision.

Programmers

Ideally enthusiastic graduates with one to two years experience in industry, who wish to immediately broaden their language/software experience.

As a team you will work closely with the client – defining the business problem, then working through analysis, design, programming, implementation and customer education. But your experience won't end there!

Services range from commercial, engineering, scientific and technical systems to management services applications using both standard products and bespoke solutions - You will have an opportunity to become involved in most of these areas.

And your career opportunities? Equally varied – as our client believes in developing people as far as their abilities will carry them. You will have an opportunity to continue in programming and analysis or move to sales support, marketing or any one of a number of specialist teams. The result is a career of unbelievable variety – certainly not matched by most end-users or service organisations – a commencing salary (at the senior level) of £7,000 per annum and the type of attractive benefits you would expect in a growth orientated organisation.

Contact Dave Scarlett 01-935 0671 or 01-540 3549 (Evenings)

SPECIALIST COMPUTER RECRUITMENT LTD.

LONDON 01-935 0671 FREEPOST

3 Mandeville Place, Wigmore Street, W1M 5LB.

Computing Services Association